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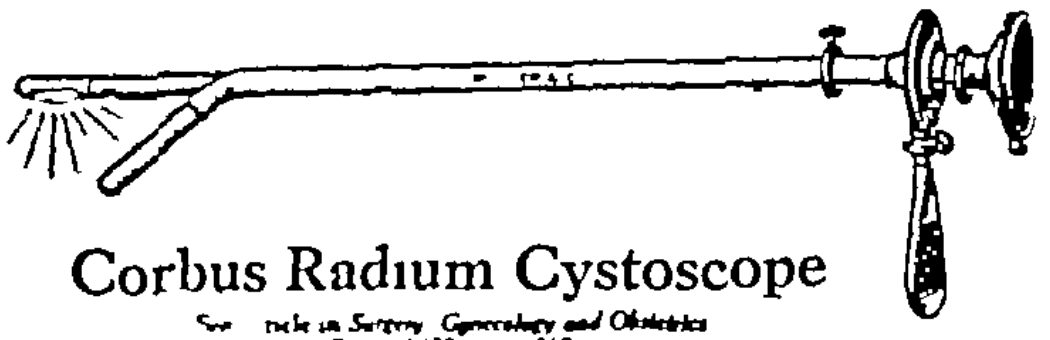
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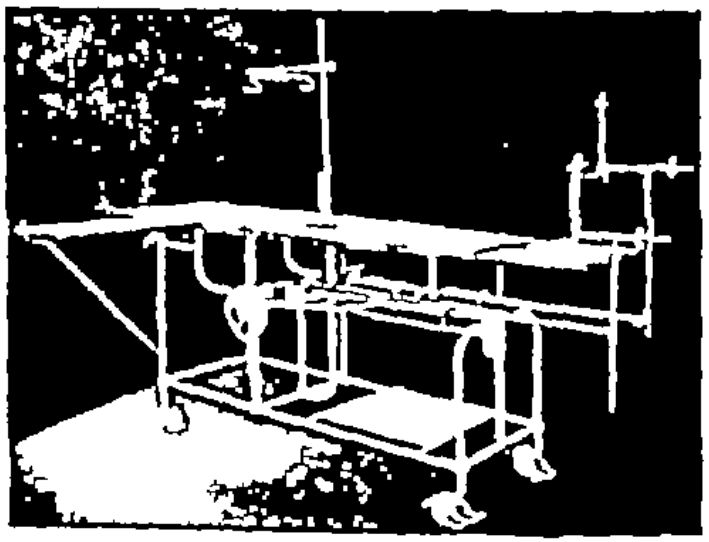
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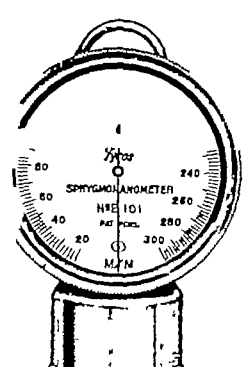


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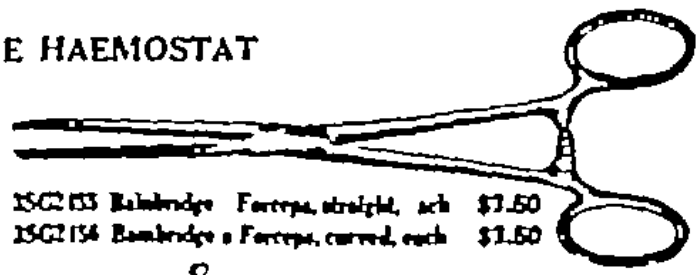
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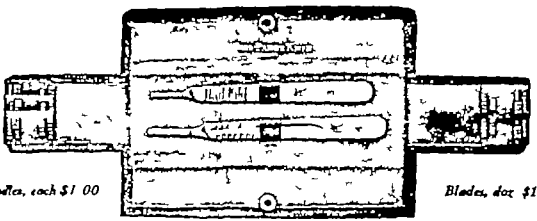
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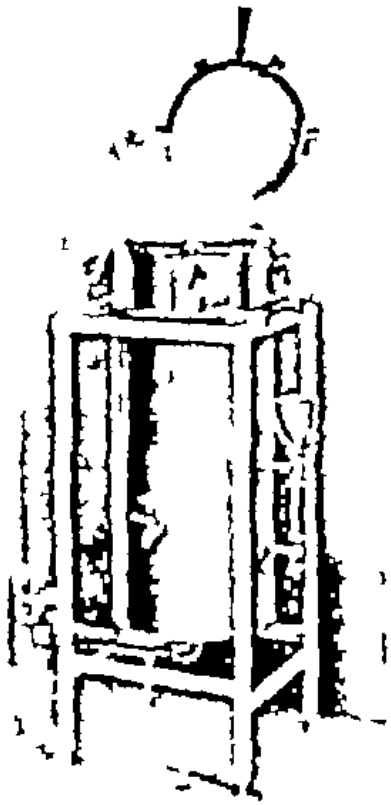
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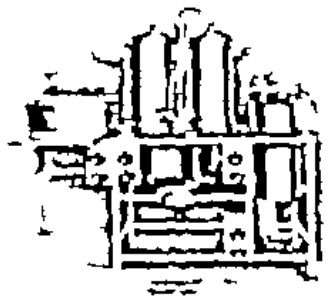
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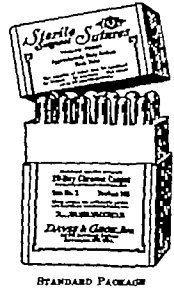
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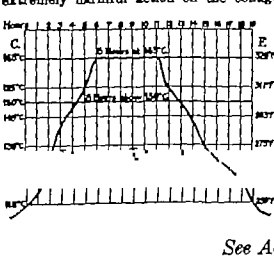


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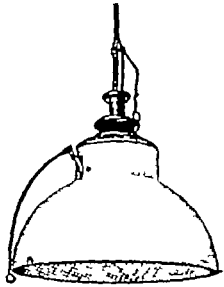
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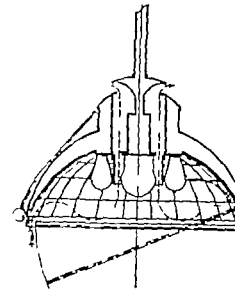
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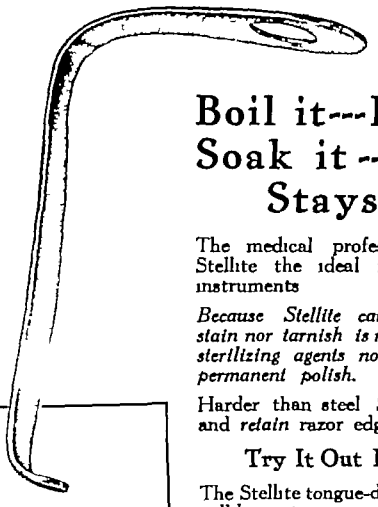
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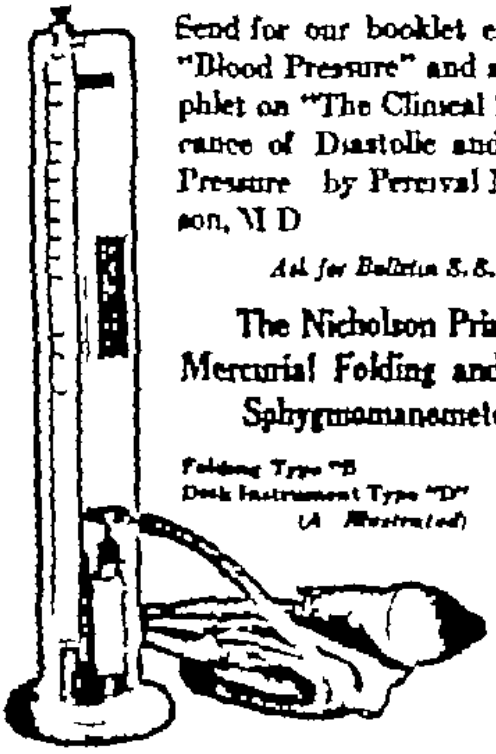
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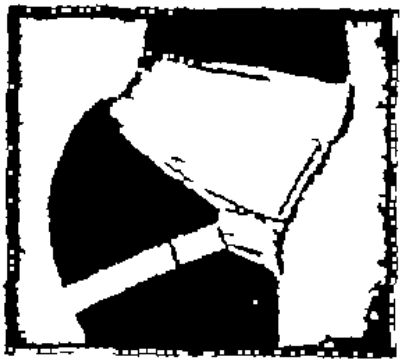
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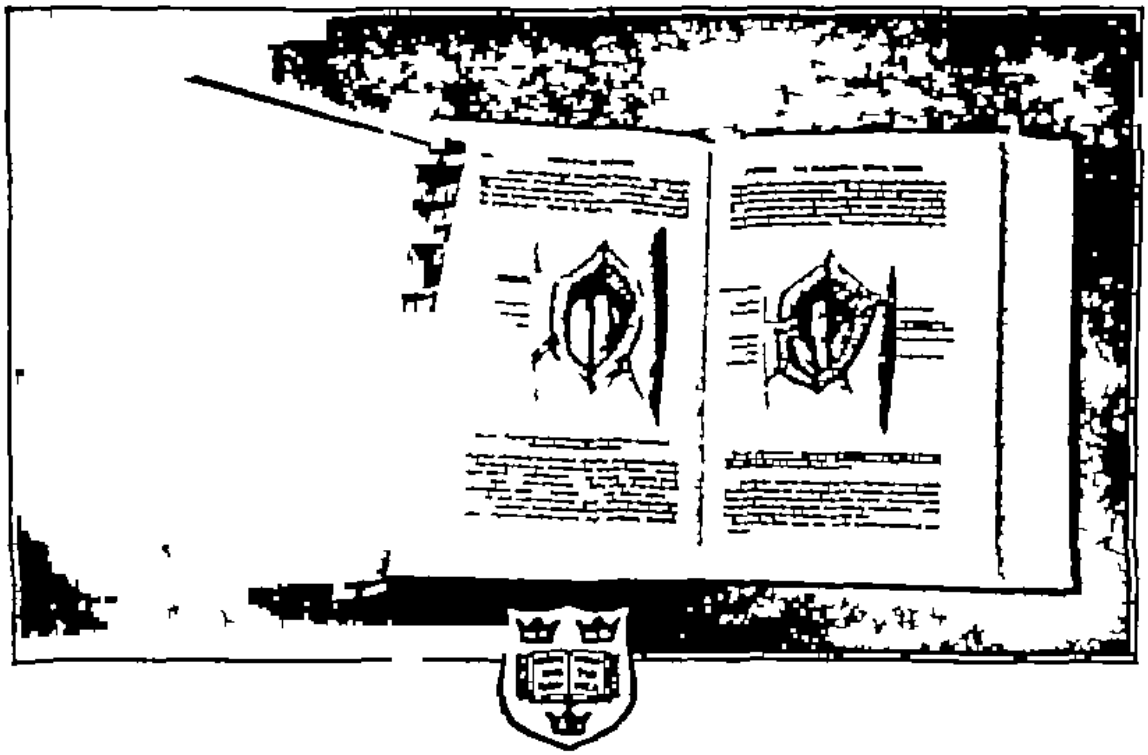
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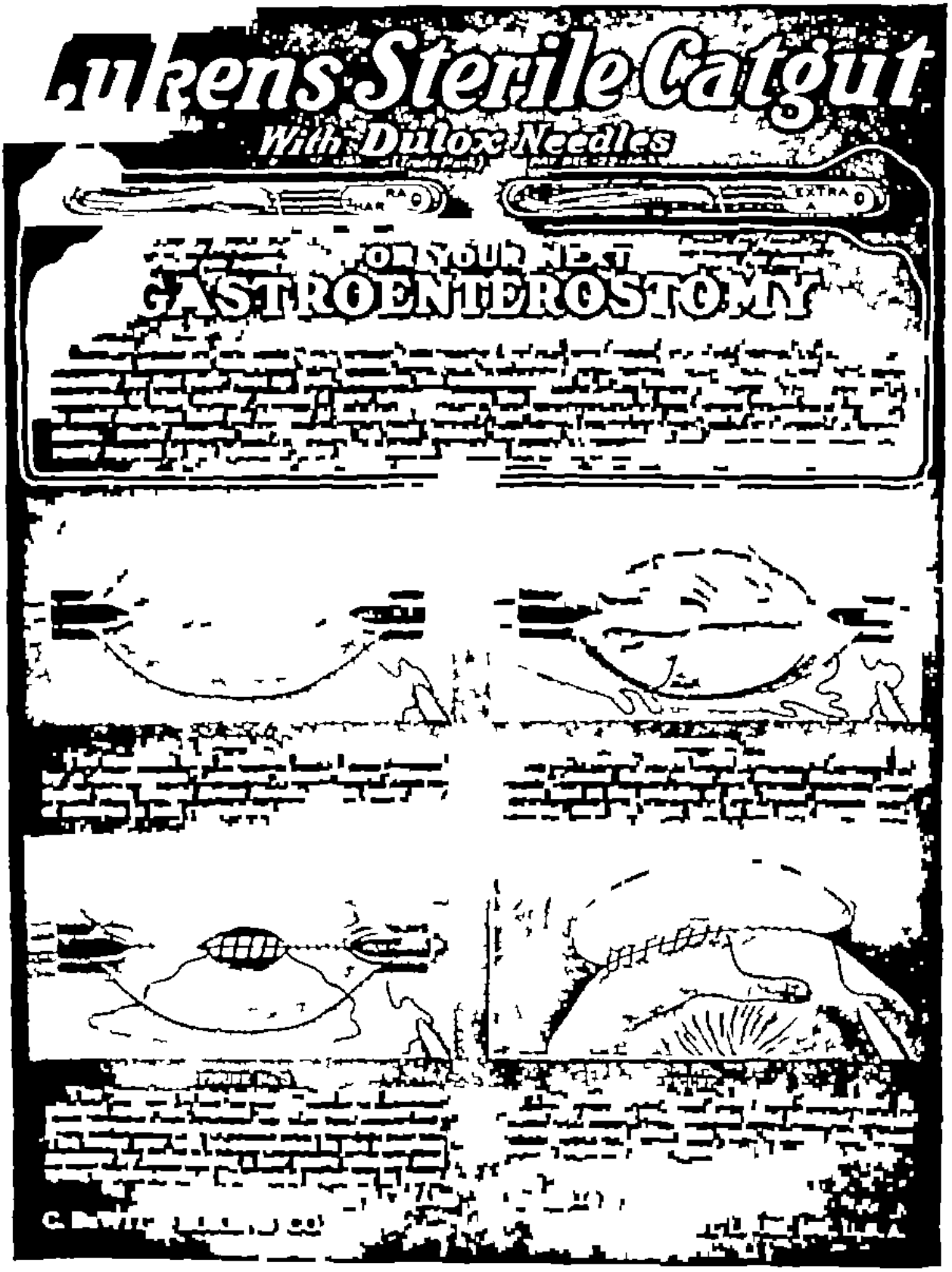
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VOLUME XXXIV JANUARY 1922 NUMBER 1

A CONSIDERATION OF THE RELATIVE MERITS OF RESECTION AND GASTRO-ENTEROSTOMY IN THE TREATMENT OF GASTRIC AND DUODENAL ULCER[1]

BY PROFESSOR F DEQUERVAIN BERNE, SWITZERLAND
Professor of Surgery University of Berne

THE question as to the relative merits of resection and gastro-enterostomy in the treatment of gastric and duodenal ulcers has not as yet been settled, as is evidenced by the papers presented at the recent medical and surgical congresses The final decision as to which operation to perform lies with the surgeon, and to enable him to make such decision he must have practical experience involving a large number of cases observed over a period of several years. In order to learn the end results in our clinic —a most important postulate—I have had our assistant surgeon Dr Wydler, study the ulcer cases which we have treated since 1910 (247 cases), and make repeated follow up examinations of them In this manner we hoped to help in solving certain diagnostic problems, in determining the general indications for operation, and finally in deciding upon the best technique to use in any particular case Our own statistics differ from those of other operators in that we have made not only more frequent follow up examinations of our cases but especially in that during the entire period of study we have done both gastro-enterostomies and resections so that we are in position to draw conclusions as to the results of the two operations. A complete report of the results of this study was published in the *Schweizerische medizinische Wochenschrift* 1921 No 25 In this paper therefore, we shall present only the most important diagnostic points from the point of view of the practical surgeon and shall give the results of the different procedures as we find them

INDICATIONS

We consider an operation indicated when stenosis or repeated bleeding is present and endangers the life of the patient or when persistent symptoms resist all efforts at medical treatment, and thus impair the efficiency and well being of the patient These limitations are mentioned because many ulcers heal spontaneously or with medical treatment, because in some cases, even after operation the tendency to form ulcers still remains, because operation does not in all cases effect a cure and because operation is accompanied by a certain risk and certain sequelæ may follow intervention, as for instance ulcus pepticum jejuni

Inasmuch as 70 per cent of the patients who come to us for treatment have suffered for from 5 to 30 years with gastric disturbances and a large proportion of the cases has been given systematic non surgical treatment without improvement, we have

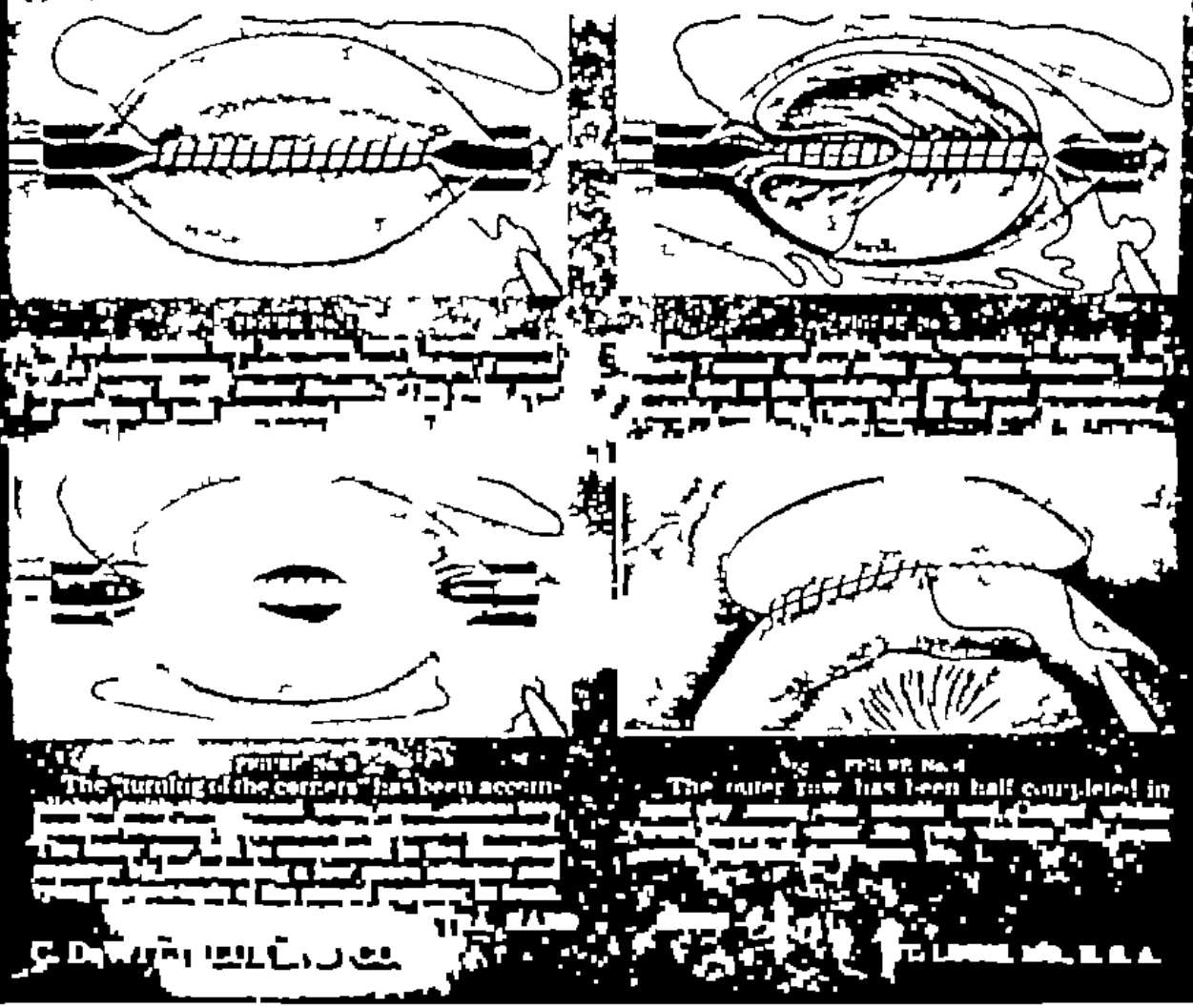
[1] Read before the Chicago Surgical Society October 1921

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after radical operation 7 7 per cent. In addition there are two late deaths after gastro-enterostomy, one from renewed bleeding from the ulcer the other from perforation of an ulcus pepticum jejuni These concern the operative mortality only indirectly but must be considered in making comparison with the statistics for resection The relatively high operative mortality after gastro-enterostomy is dependent upon the facts that the stringent rules we have adopted in selecting cases for operation exclude the mild cases of ulcer and that moderately severe cases are often operated upon by resection, so that gastro-enterostomy has been done in a great number of bad cases

The most important causes of death—and really three fourths of the true postoperative deaths are due to ung complications—are emboli, pneumonia, and lung gangrene The danger of these complications depends more on the extent of operation than on the question of anæsthesia Even after local anæsthesia we have seen embolic processes and pneumonia Perhaps there will always be an opportunity here to improve our method of procedure The statistics from our clinic confirm the old conception that a good share of cases which suffer following operations upon the stomach, with so-called pneumonia are in reality suffering from a process embolic in nature In three cases the causes of death were, respectively, bleeding from the existing ulcer, a simple heart failure, and the failure of the suture to hold in a Billroth I operation

In two cases we had to deal with what was formerly so much feared—a vicious circle—and in both cases we were fortunate in securing favorable results In two cases there was a hard infiltration in the omentum and in the connective tissue of the mesentery but no acute inflammation The entire region of the operation was changed to a compact cake The symptoms in this condition may simulate those of vicious circle

Ulcus pepticum jejuni was observed eight times in our own cases and twelve times in cases of primary operation done elsewhere We do not doubt that this condition will be found more commonly the more often and carefully the patients are examined This complication very commonly follows the von Eiselsberg pylorus-exclusion operation. The suture material used is a big factor in producing peptic ulcer This observation prompted us to avoid using non absorbable suture material After experimenting with different materials in animal research work we have decided to use fine catgut in suturing the mucosa and serosa re-enforcing these continuous sutures with cotton stitches The stitches serve at the same time to close the opening in the mesentery Since adopting this method (1917) we have observed only one case of ulcus pepticum

LATE RESULTS

Cases which on repeated examination remain completely free of symptoms, also those who present only insignificant symptoms are entered as cured those in whom there is no improvement at all or only slight improvement or in whom manifest symptoms still remain, are entered as unimproved

Because of the danger of peptic ulcer following operation and because of repeated bleeding from the primary ulcer, we have abandoned schematic gastro-enterostomy and lean more toward resection I would summarize my results in the following statements

1 That 90 per cent of ulcer recurrences, peptic ulcer and other disturbances, occur in the first 4 years after operation, so that statistics which depend on results reported earlier than 4 years after operation are apt to show too favorable results. Observations made in the first 4 years after operation do not contain all the possible sequelæ, and therefore later observations must be made in order to secure the final results.

2 That simple gastro-enterostomy produces in all forms of gastric ulcer about the same early results—somewhat more than four fifths cure or improvement approximating cure.

3 That observations made over longer periods and including all cases show for gastroenterostomy for all types of gastric ulcer, a cure or improvement in 75 per cent of cases. In ulcers at a distance from the pylorus the average results are no less favorable than in those at the pylorus.

4 That the radical methods, irrespective of interval show results similar to those in gastro-enterostomy at early periods, with a cure in about 80 per cent

Let us compare the results of the different methods of operation The so-called sleeve operation transverse section whether carried out on the fundus or near the pylorus gives very satisfactory results The V-shaped excision is unsatisfactory The end results of the Reichel-Pólya operation—end to-side anastomosis of the stomach to the upper jejunal loop with blind closure of the duodenum—are yet to be reported Its possibilities should not be overlooked Chemical analyses made after most of the operations showed a decrease in acidity most marked after the Reichel Pólya operation less marked but still present in the majority after sleeve operation and in varying manner after gastro-enterostomy This decrease is often permanent but in some cases the acid production slowly returns to normal, indeed to hyperacidity This latter holds true at least for gastro-enterostomy In X ray pictures we found after gastro-enterostomy in 6 cases a complete and in 2 cases a partial disappearance of Haudek's niche We point to this observation with all reserve for it must be studied further The reflex pylorospasm of ulcers of the lesser curvature disappears with the sleeve operation but may appear later if a recurrent ulcer forms

As a result of the findings as stated we believe we are justified in making the following statements as regards the value of the different procedures.

Even if we consider the fact that the rules which we have laid down in selecting cases for operation are very strict and that we have in general not operated upon mild early cases of ulcer still we do not doubt but that with an increase in the number of cases operated upon by sleeve resection the immediate operative prognosis will become less favorable The operation requires more time and affords greater opportunity for the production of emboli and thrombi than does gastro-enterostomy This is compensated for somewhat by the fact that after resection there is no late bleeding from the ulcer with the resultant occasional death, and the danger from peptic ulcer is almost nil Also as resection is used more the technique will be perfected and the results will improve accordingly

In gastric ulcer in all locations we find that about the same end results follow gastro-enterostomy as the radical method However in this connection let us leave out of consideration the V-shaped excision which has proved a bad method not only in our hands but also in the hands of others, and consider only sleeve resection With this method we find a cure in 90 per cent of the cases This is a result not obtained with gastro-enterostomy indeed even if compared only with the more favorable statistics as derived from tabulations made early after operation

Similarly with duodenal ulcer gastro-enterostomy yields 65 per cent cures with or without the von Eiselsberg exclusion while in 9 cases operated upon by resection we find all remain cured If properly executed resection yields better end results than gastro-enterostomy whether in a case of gastric or duodenal ulcer

In these facts there lies a satisfactory reason for employing resection even though it involves somewhat greater operative risk At this point we should state that this is true only when we do not hold ourselves to a fixed rule but rather are governed by the conditions which confront us Among such conditions may be mentioned the location of the ulcer and the resistance of the patient also the conditions under which the operation is to be carried out for there are conditions independent of the patient under which it is better that the surgeon does not resect, even if resection can be done. We include here among other things technical experience and the type of assistants present It is pleasant to be able to determine by statistics that one can with good conscience decide not to resect if these external conditions are not satisfactory Regardless of the type of ulcer one can do the patient a greater service by performing a good gastro-enterostomy than by doing a resection under unfavorable circumstances.

BENIGN TUMORS OF THE STOMACH

REPORT OF TWENTY-SEVEN CASES[1]

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BENIGN new growths of the stomach which, because of their size or position, *may cause disturbed gastric function* are rare enough to be regarded as clinical curiosities. In fact the great preponderance of gastric cancers over benign tumors of the stomach largely explains why the latter receive scant consideration in the differential diagnosis of doubtful cases A pre-operative diagnosis of benign gastric neoplasm is exceedingly difficult in the majority of cases and has rarely been made at least until very recently A great many of the cases reported in the literature have been found at necropsy and in the majority of those found at operation the true nature of the lesions had not been determined beforehand In view of the importance of surgical conservation of such a useful organ as the stomach the possibility that new growth is benign takes on a very practical aspect. *Of further clinical and diagnostic importance* is the fact that these tumors may cause complications such as pyloric obstruction intussusception of the stomach into the duodenum recurring severe gastro-enteric hæmorrhage strangulation severe colic, malignant degeneration and even perforation

Two instructive reports on this subject have been presented before this association by the late Dr Jesse Myer and by Basch For additional general reviews of the literature on the subject including excellent case reports and complete bibliographies, I would recommend the articles by Campbell Merrill Outland and Clendening Reports concerning specific portions of this material already have been published by two of my colleagues Balfour and Lemon, and by Nadeau and MacCarty in a pathological abstract

The material comprising 27 cases all verified at operation is composed of ten myomata five fibromata four angiomata two dermoids one gastric polyposis, two adenomata *and three polypis Their histological subdivisions* will appear in the more detailed consideration of each group These cases fall easily and logically into clinical classifications a primary and a secondary, in the former group it was the presence of the tumor itself which caused the symptoms justifying surgical interference while in the latter it was an associated or accidental finding during the course of an operation for other obviously major disease A brief résumé of the entire series appears in Table I

The 27 patients in the series were under observation in the Mayo clinic between the years 1907 and 1921 During this period operation had been performed on 2 146 patients with cancer of the stomach on 20 with sarcoma, and on 2 with malignant polyps *of the stomach a total of 2 168* The proportion therefore, of malignant new growths to benign new growths is as 78 to 1 or 1 3 per cent of all gastric tumors were benign But this proportion in our experience is only relative, for during the same period 2 285 additional cases of malignant gastric neoplasms, the majority of them inoperable passed through the clinic

Myomata This group of ten cases has been histologically subdivided into three leiomyomata, three adenoleiomyomata, and four fibromyomata. The three leiomyomata were classified clinically primary Two of the patients (Cases 19940 and 206857) were men aged 66 and 44 respectively Both had a marked myomatous hypertrophy involving more or less of the entire pyloric ring and presenting a palpable tumor the first one 6 centimeters by 3 centimeters in size Both patients had distressing gastric disturbances

[1]Presented before the American Gastro Enterological Association, Boston, June, 20

TABLE I —BENIGN TUMORS OF THE STOMACH

Case	Sex	Age	Lesion	A Location, B Size	Clinical Features
*199,99	M	60	Leiomyoma	A Two-thirds of pyloric ring	Gastric disturbances, irregular type nodulated cells present, later
*44684					
*200537					
841					
				B 5 cm in diameter	
77451	F	60	Adenoleiomyoma	A Anterior wall of greater curvature 3 cm from pylorus B cm by 3 cm	Cholecystectomy appendectomy
200907	F	56	Adenoleiomyoma	A Lower anterior all B 5 cm by cm	Gastric resection
*300886	M	48	Fibromyoma	A Posterior wall B 6 cm by 8 cm	Three year ulcer type of complaint, melena High normal gastric acidity, obstruction, tumor
*34863	F	65	Fibromyoma	A 7 3 cm above pylorus, posterior middle all	Chronic painful epigastric complaint achylia secondary anemia Movable, nodular tumor in left epigastrium Intussusception
*366					
1					
8					
				mm	
*3 3608	M	66	Fibroma	A Anterior wall B 3 cm	Associated carcinoma of cecum gastric history symptomless X ray shows of lesion at outlet, moderate 6-hour retention (Fig 4)
*358733	M	67	Hemangioma	A B	
5					
			Fibromyxoma		
2700	F	30	Adenoma		
867 3	F	39	Polypus adenomatous	A Near the pylorus B Small	Gastric resection for hypertrophy of the pylorus
200901	F	39	Polypus (multiple papillomata)	A Throughout stomach and jejunum B 3 mm to 3 cm	Duodenal ulcer second operation later for resection of jejunum
341 49	F	38	Polypus adenomatous	A Posterior wall 3 cm to 10 cm above pylorus B mm by 8 mm	Gall bladder disease) negative, common healed tuberculosis at both apices

*Primary cases for operation



Fig 1



Fig 2

Fig 3

Fig 4

Fig 1 Filling defect in the pylorus with a large 6-hour retention Small fibromyoma on the interior wall above the pylorus, close to the greater curvature

Fig 2 Unusual filling defect Intussusception of the tumor with the posterior gastric wall into the duodenum.

Fig 3 [illegible] the pylorus

Fig 4 [illegible] in retention.

over a long period in many respects simulating chronic ulcer Hyperacidity and gross retention were pre
of the former an
secretion in the
(Case 44684) was a male, aged 45, with symptoms extending over a period of 5 years

The tumors were mural and multiple in the jejunum and œsophagus ranging in size from 0 5 centimeter to 2 centimeters with one of medium size in the pyloric antrum This case was characterized by recurring melæna occasional diarrhœa dysphagia, and anæmia, but an entire absence of dyspepsia.

The three adenolelomyomata ranged in size from 1 centimeter to 2 centimeters, two were juxtapyloric on the greater curvature the third on the anterior wall in the first portion of the antrum Two were found during the course of an operation for ulcer or gall-bladder disease

The four fibromyomata are of considerable clinical importance since three of them were primary the patient seeking relief from them The first patient was a man aged 48 with a movable tumor above and to the right of the navel His dyspepsia was of 3 years duration strongly simulating ulcer Gastric analysis revealed moderate hyperacidity and food retention At operation a fibromyoma 7 centimeters in diameter on the posterior wall was removed The second patient a woman aged 35 had had gastric complaint of 3 months duration The pain was usually severe Gastric analysis and physical examination revealed normal conditions, but a filling defect of the pylorus, and a large barium residue was evident in the roentgenogram (Fig 1) At operation a small tumor 2 centimeters by 1 centimeter was found on the anterior wall 4 centimeters above the pylorus, close to the greater curvature. While the tumor was not pedunculated it could be manipulated as a ball valve which probably explains the course of the painful seizures The case of the third patient, a woman aged 65 is one of the most interesting in the series She had had distressing dyspepsia for 6 years, progressive in character with intermittent periods of food retention provoking emesis and a palpable movable slowly growing mass in the left epigastrium of 4 years duration She had lost more than 60 pounds in weight during the 2 years preceding her examination For 6 weeks immediately prior to her admittance the patient had daily complained of irregular pains, of watery regurgitation and distress throughout the lower chest when swallowing and when regurgitating Achylia and mucus were found on repeated gastric analysis and a very unusual filling defect was revealed by the roentgenogram (Fig 2) She had secondary anaemia At operation (C H Mayo) a fibromyoma 5 centimeters in diameter was found on the posterior middle wall of the stomach 7 5 centimeters above the pylorus The tumor dragging with it the posterior wall of the stomach had invaginated through the pylorus into the duodenum a total distance of 12 5 centimeters forming an intussusception of a portion of the stomach into the duodenum Wade and Collier have reported similar complications in benign new growths In addition to these the museum contains three specimens of fair sized myomata which have undergone sarcomatous degeneration

Fibromata The five tumors in this group occurred in patients ranging in age from 16 to 66 In one case that of a small pedunculated fibroma, 7 millimeters by 2 millimeters associated with a duodenal ulcer the surgical records did not state the location but the location in the remainder which were sessile, was definitely pyloric According to the literature this situation is the rule although our specimens neither showed malignant changes nor represented fibrous growths at the site of old ulcers Tumors varied in size from that of the smallest, already mentioned to a diameter of 2 5 centimeters. Because of the position of the growth the roentgenogram revealed a filling defect in the pylorus and six hour barium retentions (Figs. 3 and 4, Cases 208743 and 313898) In one patient (Case 53373) a woman aged 40 symptoms of 2 years standing continuous and progressively more marked for the last 5 months, in conjunction with anacidity retained food masses palpable tumor and a pyloric filling defect, certainly justified the diagnosis of gastric cancer In the second case a fibroma, measuring 8 centimeters by 5 millimeters which involved the pyloric ring presented a syndrome characteristic of duodenal ulcer of 4 years standing with hyperacidity A pylorectomy in this instance resulted in complete cure

Angiomata The four tumors of this group are histologically hæmangiomata They are exceedingly interesting because of their size and rarity Lemon reported the first one of the series in 1920 and up to that time only five others had been reported in the literature. Two of our patients, both women were in the second decade of life, one in the fifth and one

Fig 5

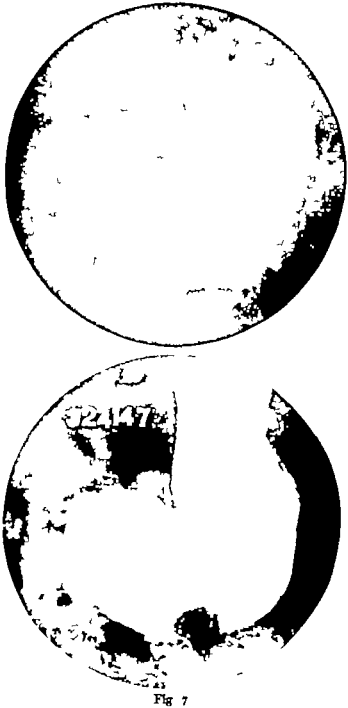


Fig 6



Fig 5 Large filling defect of the pars media and the anterior wall Angioma of the stomach (6 by 5 by 5 centimeters)

Fig 6 Angioma of the stomach as it presented on the mucous surface.

Fig 7

Fig 8

Fig 7 Filling defect on the posterior wall and greater curvature. Angioma on the greater curvature (2 5 by 2 5 by 2 centimeters)

Fig 8. Roentgenogram of tumor of the anterior wall of the stomach

in the sixth decade With one exception free hydrochloric acid was present in normal amount, and motility in all was unimpaired With one exception the tumors were round sessile quite mobile at operation, of fair size but not palpable on abdominal examination They lay between the mucosa and serosa, were of soft consistency, and bluish black, or red, the one heretofore reported situated in the fundus and anterior wall suggested on palpation a mass of angle worms and the cut section resembled lung tissue (Figs 5 and 6) In the second case the rounded pedunculated growth 2 5 centimeters by 2 5 centimeters by

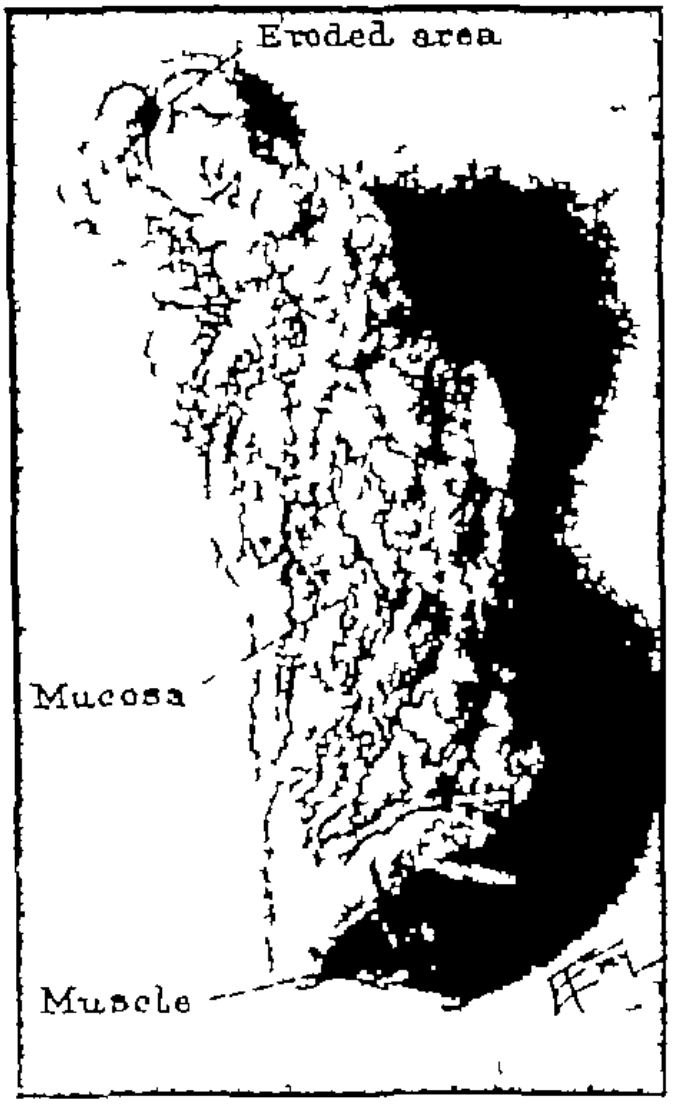


Fig 9 Sausage shaped tumor (by 3 by 2 5 centimeters)

2 centimeters was attached midway to the greater curvature and posterior wall (Fig 7) The ulcer crater in the apex of the tumor explained the bleeding and anemia. In the third instance an unusual bologna shaped tumor measuring 11 centimeters by 3 centi meters by 2 5 centimeters, situated in the anterior wall was found Dyspnœa and weakness were the complaints presented but on closer questioning an occasional sense of fullness after meals and emesis were revealed The patient, a man aged 50 was very anemic (hæmoglobin 44 per cent) gastric analysis showed an absence of free hydrochloric acid a considerable number of fresh red blood cells and bits of tissue in the lower power field These features with the filling defect in the roentgenograms (Figs. 8 and 9) is was made The feces pathogenic amœba and flagellatæ. The latter had probably provoked the diarrhœa. Erosion was found in the tip of the growth.[1] The last case the only one of its kind to my knowledge, illustrates the diagnostic value of routine roentgen ray examination in all doubtful or obscure cases. The patient, a woman aged 22 was of a nervous temperament, and had had dyspepsia since childhood which was characterized by nausea and marked frontal headache, occasionally extending to the occiput, usually appearing 2 or 3 hours after a meal and terminating in an hour or two by vomiting of sour gastric contents followed by complete relief These attacks were brief and intermittent, were often provoked by dietetic indiscretions and in later years were prevented by small amounts of soda before and after meals. *Up to within 6 weeks before* her examination epigastric distress or pain had been absent, but since that time she had experienced two violent attacks of pain in the epigastrium about 4 hours after a meal, pre ceded by the usual dyspeptic symptoms and terminating in emesis with relief The patient attributed these seizures to excite ment of moving in the first instance and in the second to the hasty preparation for a trip The physical examination was practically negative except for moderate anæmia, which was attributed to a severe menorrhagia present since the onset of menstruation at 14. She was 12 pounds below normal weight. Gastric analysis revealed normal acid values with hypersecretion The roentgenogram revealed a large rounded mobile mass in a dilated duodenum which was diagnosed be-nign tumor (Figs 10 and 11) At operation (E S Judd) a rounded sessile mass just without the pyloric ring about 7 centimeters by 5 centimeters covered by a thin mucosa, was easily removed It had the gross appear ance and feel of œdematous myoma, but on section and microscopic examination it proved to be a hæmangioma. The patient is having

[1] A detailed description of the above three cases of hæmangioma will appear in a paper by Dr Judd

an uneventful convalescence The painful seizures can best be explained by a temporary occlusion of the pylorus by the tumor

Dermoids So far as I know only a few of these cases have been reported Our first patient a man aged 31, was one of the earliest cases in the clinic For 4 years he had had recurring attacks of hæmatemesis and melæna, finally causing severe anæmia and weakness Free hydrochloric acid was present (hæmoglobin 40 per cent) A tentative diagnosis of asymptomatic bleeding peptic ulcer was made Operation revealed a rounded tumor of the posterior wall of the stomach 7 centimeters by 6 centimeters by 5 centimeters *This was diagnosed dermoid by the pathologist.* The second patient was a boy aged 8 About 4 years previously his parents had noticed a small lump in his abdomen which seemed to be more prominent at times especially when standing The lump had enlarged gradually but during the 6 months prior to examination growth had been marked Aside from some urinary frequency the patient had no symptoms Examination showed a large movable non sensitive mass filling the upper and central portion of the abdomen A gastric analysis was not made Roentgenograms did not reveal retention



Fig 10 Large, rounded, mobile mass in a dilated duodenum.



Fig 11 Photograph of angioma (7 by 5 centimeters) removed from duodenum proximal to the pyloric sphincter

from the six hour barium meal. The stomach was very high, occupying a transverse position The displacement upward was due to a large palpable tumor which was extrinsic and did not deform the gastric lumen (Fig 12) At operation a gourd shaped tumor, weighing 1,000 grams was found attached to the posterior wall of the stomach and projecting into the lesser peritoneal cavity The tumor was larger than the stomach itself This was diagnosed dermoid cyst by the pathologist (Fig 13)

Gastric polyposis This is probably the rarest form of benign tumor of the stomach The only case seen in the clinic has been described in detail by Balfour He states that the tumor was then found for the first time out of approximately 69 000 abdominal operations 8 000 of which were for gastric lesions Carman has seen only two cases in about 50 000 roentgen ray examinations of the stomach one of which was the one described by Balfour, the other was the case of polyposis reported by Myer As a result of Myer's own careful clinical observations over



Fig Stomach displaced upward, occupying a transverse position

a long period in this case and of similar observations made in the cases of Wegele and Chosrojeff he states that gastric polyposis is more than probably present when such a combination of acute gastric hemorrhage achylia gastrica, increased gastric motility and abnormal mucus production of an egg white character is observed Achylia gastrica hypermotility and excess of mucus were present in our case that of a man aged 31 with distressing epigastric symptoms of 8 years duration The roentgenograms in both cases are quite characteristic and show a diffuse mottled appearance of the pars pylorica and the lower pars media without 6-hour retention or a corresponding palpable mass This mottling is due to the displacement of the barium by the approximation of the polypi which offering no resistance to the X ray produce numerous small, black shadows in the silhouette of the stomach (Figs 14, 15 and 16) Ruggles has recently reported one case with detailed roentgenological findings This tumor was described as a



Fig 13 Dermoid cyst (weight 1,000 grams) of the posterior wall of the stomach in a boy aged 8

papillomatous rather than an adenomatous structure as originally described by Menetrier Finney and Friedenwald reported two cases of gastric polyposis which had undergone malignant degeneration

Adenomata There were two of these tumors in the series, both were small and in women aged 27 and 30 respectively The first tumor 2 5 centimeters by 1 centimeter was situated 1 centimeter above the pylorus and was a Brunnerian adenoma, first described by Hayem It was mural apparently symptomless and was excised during the course of an operation for gall-bladder disease The second one found during the course of an exploratory operation was also symptomless, and was a small, hard inflammatory adenoma, 5 centimeters above the pylorus on the lesser curvature Novak and Stretton have recently reported single pedunculated adenomata on the posterior wall of the stomach near [illegible]
simul
litera
gastric adenomata has become fairly extensive

Polypi The term polyp in the clinical or descriptive sense signifies any small pedunculated tumor The majority of polyps are undoubtedly mucous We have restricted the use of the term to adenomatous or papillomatous growths in conformity with pathological terminology There were three of these in the series. All the patients were



Fig 14 Roentgenogram of gastric polyposis



Fig 15 Appearance in the roentgenogram of the stomach after Pólya resection

women The tumors had been found during operation for other major conditions Two of the polyps were adenomatous both single one small near the pylorus the other 11 millimeters by 8 millimeters on the posterior wall, 7 5 centimeters to 10 centimeters above the pylorus In a third case that of a woman aged 38, the polypi comprised multiple papillomata, scattered throughout the stomach and jejunum, and varied in size from 5 millimeters to 3 centimeters This patient had a chronic duodenal ulcer

SUMMARY AND CONCLUSIONS

The 27 cases of benign tumors verified at operation comprise seven different varieties in which are included myomata with their histological subdivisions, fibromata hæmangiomata, dermoids polypi, adenomata etc. They represent 1 3 per cent of all the gastric tumors which have been operated on Seventeen of the entire number were clinically classified primary growths because they were found to be the chief cause of the patients' complaint. Perhaps the most interesting group in this series because of comparative rarity and size, is that of the hæmangiomata. Twelve of the patients with this condition were males and 15 were females The ages varied from that of a boy of 8 with a 1000 gram dermoid on the posterior wall of the stomach to that of a man of 67 with a hæmangioma on the anterior wall and body of the stomach The largest number, seven in each, was found in the second and sixth decades of life One half of all the patients were more than 40 In 13 cases the tumors were in close proximity to the pylorus in 5 they occupied the posterior wall, in 5 the anterior wall and in 2 they were generally distributed throughout the stomach In one case in which the œsophagus and jejunum were involved, and in one an early case, the records do not state the exact location The size and shape of the tumor were variable because of the various types encountered The majority were sessile rather than pedunculated

patients had palpable tumors 3 of which were fibromyomata 3 were fibromata 1 was a dermoid, and 1 was a leiomyoma. The average loss of weight in the primary group was 25 pounds Ten patients had recurring hæmorrhage with anæmia and weakness. This was chiefly due to ulceration or erosion of a portion of the tumor Three of the 4



Fig 6 Gross specimen showing gastric mucosa studded with polyps

patients with angioma had severe bleeding and anæmia. Seven patients had obstruction this includes one patient with a fibromyoma of the posterior wall which had caused an intussusception of the posterior wall of the stomach into the duodenum Severe painful seizures simulating gall stone colic were noted in several cases of juxta pyloric tumors which even though not pedunculated could be manipulated as ball valve tumors Myomatous tumors of the pylorus with or without pyloric obstruction, simulate the duodenal ulcer syndrome The roentgenologic appearance of the larger tumors is quite indistinguishable from that of gastric cancer Carman believes that a larger experience with this group will enable him to differentiate roentgenologically the two types more frequently than has been possible heretofore

1 Benign tumors of the stomach are rare and constitute only 1 3 per cent of all gastric tumors that have come to operation The actual proportion of benign new growths to malignant new-growths or ulcerations is as 1 is to 200

2 Myomata and fibromata constitute the largest group gastric polyposis the most infrequent.

3 About 50 per cent of benign tumors are found in patients more than 40 There is no characteristic syndrome and gastric chemism ranges from achyha to hyperacidity with hypersecretion The summation of evidence favors the diagnosis of gastric cancer

4. The majority of the tumors are situated in the region of the pylorus the greater curvature anterior and posterior walls.

5 The smaller tumors are practically symptomless unless situated at the orifices or unless multiple

6 Common complications are recurring hæmorrhage which occurred in 37 per cent and pyloric obstruction which occurred in 25 per cent. Palpable mass, food retention, or 6-hour barium retention is less frequent than in gastric cancer

7 Often patients with benign gastric tumors are refused operation because the condition is regarded as malignant and in operable The true nature of the lesion is discovered only when the patients insist on operation.

8 The surgical end results are excellent.

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INTERSTITIAL PREGNANCY

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DESPITE the relatively large number of interstitial pregnancies observed and operated upon in different clinics, the characteristic signs of this anomaly of gestation have not so far been described sufficiently clearly to enable one to differentiate in clinic this variety of extra uterine pregnancy from any other variety Its variable development and the symptoms peculiar to each case render clinical diagnosis almost impossible. Even the macroscopic anatomy of the specimens studied in many cases is open to discussion and presents obscure points Waegeli (1) makes special mention of this in his review which includes the majority of cases reported up to 1915—more than 50 undisputed cases Vaudescal emphasizes the importance of microscopic examination saying that in many cases histological study has not been made and that in many of the cases a diagnosis of interstitial pregnancy is questionable According to Vaudescal microscopic examination is the only absolute means of confirming the presence of an interstitial pregnancy

By reporting new cases and by studying each case carefully, we shall certainly some day be able to recognize the signs and symptoms which will enable us to make a clinical diagnosis. We have had occasion to operate upon two cases of interstitial pregnancy, and we report below the findings in them.

Case 1 Left sided unruptured Interstitial pregnancy Abdominal supravaginal hysterectomy with ablation of the adnexa.

Anne Ch age 26 entered Hospital Celtza July 11 1919 (No. 495) The family history revealed nothing of importance. The periods began when the patient was 13 and have always been irregular and associated with dysmenorrhœa. The patient has been pregnant seven times four pregnancies terminating in normal labor and puerperium three in abortion at about 6 weeks, without complications The patient claims never to have been ill

Present illness The last menstrual period began March 25 1919 About 2 weeks following the time

white membrane The bleeding with expulsion of the membrane was ascribed by the patient to an abortion Since this time (about 2 months ago) there has been irregular loss of blood extending over periods of 1 to 3 days, and repeated approximately every 8 days Because of this bleeding the patient decided to enter the hospital. Aside from the metrorrhagia there was no complaint of other

amination of the principal viscera and systems failed to reveal any appreciable pathology The breasts showed neither lacteal secretion nor areolar changes

No tumefaction was found in the pelvic cavity by abdominal exploration. The cervix was hard and turned to the left The external orifice was transverse with a laceration to the left. With the speculum an ectropion of the anterior lip of the cervix could be observed The body of the uterus was displaced to the right, it was increased in size in anteflexion with a slight lateroflexion The fundus was normal on the right. On the left could be felt a rounded sessile tumefaction the size of an egg and incorporated with the uterine cornu, without an appreciable demarcing depression and movable *en bloc* with the fundus. The tumor was smooth and

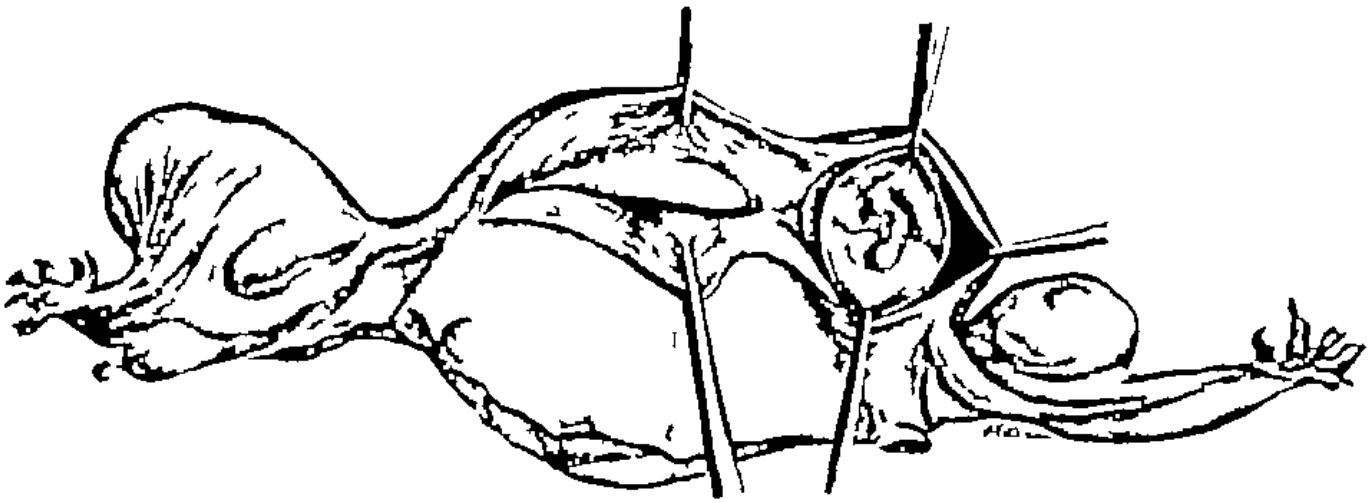


Fig. 1. Cross section of specimen shown in Figure 2 viewed anteriorly



Fig. 2. Anterior view of left-sided, non-ruptured, interstitial pregnancy. Case 1. The enlarged uterus is composed of two masses; on the right the uterus is of practically normal dimensions, on the left the ovular tumor the size than on the opposite side. The right tube is somewhat distended and measures 7.5 centimeters. The left ovary is normal and contains a corpus luteum on its superior border. The right ovary, double in size and infiltrated with macrocysts, is covered with dense adhesions.



Fig. 3. Anterior view of right ruptured interstitial pregnancy. Case 2. The uterus is normal on the left. At the level of the right horn is a rounded mass, separated from the corresponding border by a scarcely perceptible

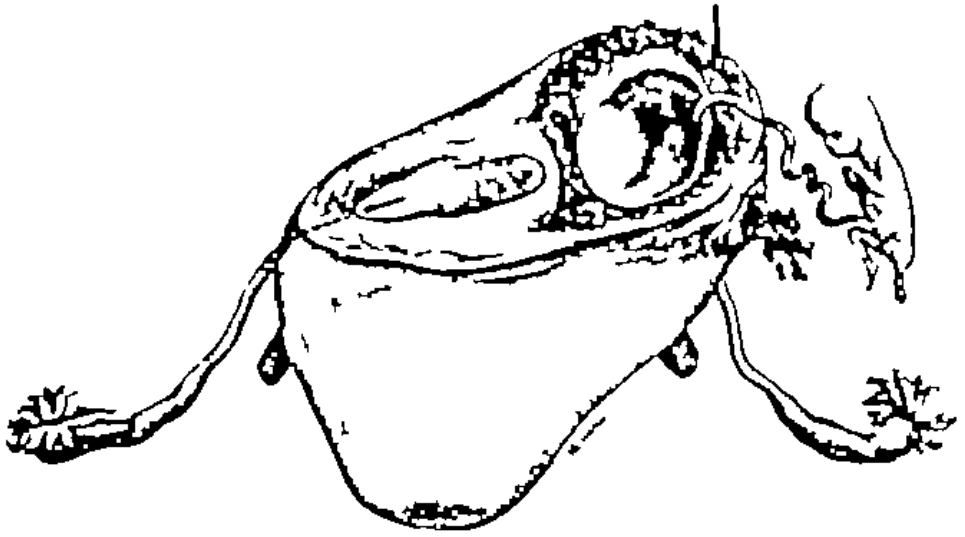


Fig. 4.

Fig. 4. Cross section of specimen, Case 2. A stylet in the left ostium uterinum is shown penetrating the lumen of the isthmic portion of the corresponding tube. The right ostium uterinum leads into the intramural sac. A stylet indicates the position where the tubal isthmus opens into the ovular sac. The ovular sac is formed of a thin muscular wall, containing an intact ovum, covered by placental tissue. An embryo of 10 centimeters is suspended by a delicate umbilical cord from the ovular sac.

a trifle softer in consistency than the uterus The vaginal fornices were free on the left side both front and back On the right side could be palpated a swelling which was painful The swelling was the size of an almond and resembled a right sided chronic adnexitis.

Operation July 20 1919 Lumbar and spinal anæsthesia—0 72 centigrams of novocaine Medial subumbilical laparotomy Upon opening the abdomen the lesions found confirmed the clinical diagnosis on the left a rounded tumor on the right the ordinary adnexal lesions. We therefore did a supravaginal abdominal hysterectomy with extirpation of the adnexa on both sides, pentonization, and closed the abdomen without drainage. The postoperative convalescence was without incident, the patient was up and about on the eighth day and left the hospital in good health on the twentieth

Examination of the specimen The specimen secured was composed of the uterine corpus and the adnexa (Fig. 2) From in front the uterine body is of irregular form and is enlarged toward the fundus to almost double its normal size It appears to be composed of two masses that on the right of a mass normal in outline and of the dimensions of the body of the uterus that on the left of a rounded mass situated on the border of the uterus at the level of the corresponding horn and not extending above the level of the fundus. Smooth rounded *the size of an unhulled walnut and of a trifle softer* consistency than the fundus, this mass is distinguishable from the corresponding uterine border by a very shallow vertical depression more marked upon the anterior face and giving to the whole a bi lobed appearance The entire surface of the uterine mass is covered by smooth pentoneum with out adhesions.

The transverse diameter of the whole at the level of the tubes is 8 centimeters, the height of the corpus is 5½ centimeters. Viewed posteriorly the specimen presents the same general aspect except that here the tumor seems more evidently bulging especially vertically as a whole

The left round ligament is attached to the antero-inferior face of the left uterine mass, at a distance

5 millimeters below the tube

The left tube, normal in appearance is attached to the left side of the uterus, on the antero-external border of the cornual tumor somewhat lower down than the opposite tube is attached It is of normal

is attached at the extremity of the corresponding uterine horn

Cross section along the uterine fundus for the purpose of studying the interior aspect of the cornual tumor (Fig 1) shows the presence of an abnormally placed gestation. This section shows the uterine cavity increased in volume in the transverse diameter and asymetric The left half of the fundus is farther developed than the right and forms a sort of diverticulum, directed upward and laterally The *cavity of the uterus therefore is shaped like an unequal T* The walls of the uterus are hypertrophied, their thickness varying from 8 to 10 millimeters, but beginning progressively to attenuate toward the left horn of the fundus uteri In the left uterine horn, entirely within the muscular wall is seen an *intramural cavity containing a fœtal cyst.* The ovum is about 3 centimeters in diameter, or about the size of a small walnut. It consists of an amniotic sac completely filled with a transparent, pale yellow liquid, which surrounds an embryo of 1 5 centimeters. The small size of the embryo as compared to the duration of the gestation suggests that the ovum has been arrested in development. Between the ovular membranes and the left wall of the ovular attachment is a deposit of clotted blood To the right the fœtal cyst over half its external surface is covered by placental tissue. The placenta, adherent to the uterine muscle can be separated from it by a spatula The intramural ovular cavity is limited by a layer of muscular tissue of 1 to 3 millimeters in thickness On removing the fœtal cyst it is found that the ovular cavity communicates freely on the *side with the interior of the tubal isthmus. A stylet* introduced into the fimbriated extremity of the tube passes backward into the ovular cavity The left uterine horn communicates by way of the dilated ostium uternum, through an intermediary canal of about 7 to 8 millimeters in length opening into the intramural. A partition of 1 to 2 millimeters thickness, easily seen in Figure 1 separates the left uterine horn from the ovular cavity The mucosa of this horn appears to be interrupted at the level of the canal of communication between the two cavities uterine and ovular On the right a fine stylet may be introduced into the natural opening between the uterine horn and the tube (ostium uternum) visible to the naked eye

To summarize we have in this case a para VII, 26 years of age who following a delay of menstruation of 15 days suffered with pelvic pains and metrorrhagia and expelled a membrane the condition being ascribed to an abortion Following this painful crisis, the metrorrhagia in scant amount continued for approximately 2 months, for which reason the patient decided to enter the hospital Because of the history and because of the presence of a tumor at the level of the left uterine horn, we

the left

Macroscopic examination showed the ovular cavity entirely within the muscular wall the round liga

normal

which

inter

stitial pregnancy Unfortunately the disorganization of our laboratories following the war has not permitted us to make a histological study of the specimen.

CASE 2 Ruptured interstitial pregnancy Supravaginal abdominal hysterectomy with conservation of both ovaries.

Lucrece, J., age 42 entered the Maison de Sante of Dr Antonin, July 3 1930 to be placed under observation following curettage in another city

pain. Patient was married at age of 17 and is now a para VII She was pregnant the first time 6 [illegible] was normal and ond pregnancy the birth of a some months after the preceding resulted in the birth of a dead foetus A fourth pregnancy 3 years later resulted in a living child, which died later of meningeal complications The fifth pregnancy terminated in an induced abortion at 4 weeks which resulted in pelvic infection lasting 4 weeks and necessitating the opening of an abscess in the iliac fossa Impregnation occured a sixth time 6 months after this elivered as been at pain. is menpatient suffered from menorrhagia, this occurring between the second and third pregnancies The husband was afflicted with syphilis at the time of marriage.

Present illness The last normal menstrual period occurred April 29 to May 4, 1930 The following period May 29, 1930 was missed After 15 days, toward the 15th of June, the patient aborted following curettage by a physician After this she states that she felt well for about 8 days. Nine days after abortion she was taken with chills and she noted a serous vaginal discharge Because of persistent nausea and the absence of bleeding the physician decided to do a second curettage (June 28 15 days after the first) Following this, there were pelvic pains, localized in the left iliac fossa and the patient came for consultation to Bucarest

Examination upon arrival On July 13 1930 3 months after the termination of the last period, we found that the patient was suffering some mild pelvic pains, more marked in the right iliac fossa, which became more severe during the following days There was a scant serosanguinous discharge, without any real bleeding To these phenomena might be added constipation, anorexia, and some headache. The temperature remained below 37 for a week, then rose to between 37 and 38° during the following 6 days Vaginal examination disclosed a long, hard, gaping cervix, an enlarged corpus having almost the dimensions of a 3 to 4 weeks pregnancy soft, mobile and flattened anteroposteriorly The uterine cavity measured 8 centimeters, by hysterometry The left adnexa appeared normal On the right was found a swelling the size of a fist, including the uterine border At first we considered this mass a postabortive right adnexitis.

The patient was placed at rest. She was given vaginal douches and iodine was applied to the uterine cavity On re-examining the patient, July 10 after 7 days of medical treatment I was surprised to find

curettages, of the presence of an abnormal pregnancy Upon questioning the physician who had performed the two curettages I was told that he had both times secured what seemed to be ovular fragments. July 10 9 weeks after the last period and about 1 month after the first curettage, the patient while coming from the dressing room was seized with severe abdominal pains, became pale and fainted suggesting at once a rupture of an abnormal gestation The patient was returned to bed Ice was applied to the abdomen, and the subsequent condition closely observed. Temperature 37.8° C., pulse 90 An examination on the following day disclosed a peritoneal inundation of moderate extent rising to the umbilicus Clots could be felt in the cul-de-sac of Douglas.

Operation July 17 1931 almost 10 weeks after the termination of the last period the patient was submitted, under spinal anesthesia, to a median subumbilical laparotomy Upon opening the peritoneum there was found extravasated into the peritoneal cavity a large quantity of coagulated and liquid blood The uterus, increased in volume and asymmetric, presented on its right horn an elongated sessile tumor, the size of an egg, incorporated

abdominal hysterectomy was done. Both ovaries were left. Suprapubic peritoneal drainage was established, and the abdominal wall closed with three layers of sutures. Postoperative recovery was excellent, the patient quitting the bed on the tenth day and leaving the hospital on the twelfth day postoperative.

Examination of the specimen. The specimen from this case consists of the uterus and the two tubes, the two ovaries having been left *in situ* (Fig. 3)

The uterus, increased in size, forms an asymmetric body, ovoid, elongated toward the right horn, and forming an apex, and is occupied by a sessile tumor the size of a large hen's egg A scarcely perceptible depression distinguishes the right uterine border

from the cornual tumor The asymmetry is caused by the exaggerated development of the right uterine horn. On the posterolateral surface of the tumor there is an irregular defect, of about 8 to 10 millimeters in diameter The elevated smooth, violaceous mass is entirely surrounded by smooth peritoneum free of adhesions. The vertical diameter of the uterus is 9 centimeters. The axis of the cone formed by the total extirpated mass measures 12 centimeters. The transverse diameter from one tubal insertion to the other is 8½ centimeters. Cross

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interstitial gestation (Fig 4) As can be seen in Figure 4 there are two independent cavities (*a*) *that of the enlarged uterus and* (*b*) *that of the ovular* sac, hollowed out in the left cornual wall The cavity of the uterine fundus is increased in size its two horns are moderately dilated the right cornu forms a diverticulum directed above and laterally The thickened uterine wall measures approximately 1½ centimeters. The uterine mucosa is congested The uterine cavity is separated from the ovular sac by a muscular partition of the thickness of about 3 to 4 millimeters. One may recognize with the naked eye in the walls of the two horns the tubal orifices (ostia uterina) which were successfully catheterized, by the aid of a fine metallic hairpin A pin will pass from the uterine cavity into the left tube as may be observed in Figure 4 A fine stylet can be passed from the cavity of the fundus into the ovular sac on the right. The interior of the right uterine horn is a rounded rather smooth cavity

and entirely covered by peritoneum save at the level of the corresponding broad ligament. At the point of rupture the wall of the sac is quite thin bulging laterally infiltrated with blood, and separated from the ovum by clotted and fluid blood In the ovular cavity is an ovum of about 2 months development, in active evolution. In the amniotic sac, filled with a serous light yellow liquid is an embryo 7 millimeters in length Placental tissue covers about two-thirds of the surface of the ovum. Blood clots and fluid blood has separated the ovum from the lateral wall of the sac.

The round ligament to the right is attached on the antero-inferior aspect of the cornual tumor 3 or 4 millimeters lower than the insertion of the tube. The left round ligament is attached to the antero-superior surface of the left uterine horn, a trifle

The right tube, of normal
likewise 9 centimeters, opens freely into the ovular cavity A fine stylet, introduced into its interior passes through the lumen of the isthmic portion into the ovular wall

Both ovaries, in good condition, have been left in place. The right ovary contains a corpus luteum on its lateral extremity (We have been unable for lack of laboratory facilities, to secure a histological examination of the specimen)

CLINICAL ASPECTS

Interstitial pregnancy manifests itself by variable symptoms resembling those of other forms of ectopic gestation The early stage is disclosed, as in both of our cases and as indeed it is in almost all the published cases, by a delay in menstruation (a delay of 15 days in both our cases) followed as in our Case 1, *by the expulsion of a deciduum, with profuse* metrorrhagia The physical findings are quite variable. There are anatomic forms where the ovular sac is fused with the uterus, incorporated with it, so to speak, the uterus becoming as in our two cases and in those of Maygrier Bonnaire and Brac, Rosenthal, Waegeli, Vaudescal etc. more or less asymmetric. In other forms, the interstitial gestation is clearly distinct from the uterine body as in the cases of Bosse, Léopold, Henkel, Bar and Buffnoir etc Between these two types may be found every anatomical intermediary The variation in the anatomical characters depends according to Vaudescal upon the point of primitive implantation of the ovum and upon its age and its stage of evolution The result is an extremely variable appearance of the utero-ovular mass such that an anatomical diagnosis, in certain complex cases cannot be arrived at even with the lesion in plain sight at the laparotomy

However, in the majority of cases upon determining the presence of one or several of the classical characteristics of intramural implantation of an ovum the existence of an interstitial pregnancy may be determined by simple macroscopical examination of the specimen. There are three principal characteristics which should be considered viz, asymmetry of the uterus, asymmetry of the adnexa, and lateral insertion of the round ligament.

Uterine asymmetry. Ruge-Simon's sign This sign exists in the majority of cases (Waegeli) and is characterized by elevation of the fundus on the side of the abnormal horn Under the influence of the abnormal insertion of the ovum into one of the uterine

horns and of the habitual tendency of an interstitial gestation to develop upward at first, by reason of the conformation of the interstitial portion of the tube (Vaudescal) there occurs a verticalization of the fundus of the uterus producing a cone-shaped organ.

According to Lequeux the presence of the Ruge-Simon sign depends upon the primitive seat of implantation of the ovum. When the nidification occurs in the musculature of the fundus, the ovum develops in an ascend ing direction producing the sign. When the implantation occurs in the musculature of the lateral wall the Ruge Simon sign is absent We have seen in Case 1 that the ovum, in stead of developing upward grows outward from the left lateral border of the uterus giving rise to the natiform appearance of the extirpated specimen. In Case 2 on the con trary the asymmetry was due to the ascend ing or vertical development of the process in the right uterine horn.

Asymmetry of the adnexa Under the influ ence of an abnormally developed pregnancy the tube on the gravid side is usually drawn upward by evolution of the ovum which produces the asymmetric attachment of the adnexa. The constancy of this anatomical condition is associated with the uterine asymmetry Here as for the uterus, Lequeux holds that the respective situation of the adnexa depends upon the nidification and the direction of evolution of the abnormally implanted ovum When the evolution of the gestation is vertical, the corresponding tubal insertion is drawn upward when the ovular sac develops downward the insertion of the tube will be lateral or descendant (Cases of Lequeux Rosenthal Glaesner C Daniel, etc.) in relation to that of the opposite side, thus producing adnexal asymmetry In Case 2 despite the ascending position of the ovum the tubal insertion is scarcely higher on the gravid side

Lateral insertion of the round ligament In general the round ligament of the gravid side is attached lateral to the fœtal tumor and is displaced laterally together with the tube by the development of the ovum The insertion of the round ligament varies accord ing as the tube is attached also as Lequeux remarked It varies with the anatomical conditions and the direction of development of the ovum It may be implanted in the center of the lateral aspect of the ovular mass (Vaudescal) it may be displaced downward (when the gestation has evolved upward, as occurred in both our cases) finally, it may be displaced upward (when the gravid process evolves downward) and it may even be found medial to the gestation mass as in the cases of Wagner and Lequeux.

Unfortunately none of the anatomical characteristics which we have just described offers any help of clinical value since in our two cases as in all published cases the diag nosis was not established until after exam ination of the specimen removed at laparot omy Nevertheless in a thin woman with a flaccid abdominal wall, one might, by pal pation, study the situation of the gravid tu mor in its relation to the uterus and even the position of the round ligament in its re lation to the ovular mass, and thus formu late a possible diagnosis of interstitial ges tation. The asymmetry of the gravid uterus (Ruge-Simon sign) and especially the situ ation of the tumor in front of the uterus should, according to Professor Bar (1) sug gest a pregnancy either interstitial or cornual (variety which transforms itself into a uterine pregnancy)

The posterior situation of the tumor in
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ligament
attached lateral to the cornual tumor the pos sibility of an interstitial gestation is suggest ed rather than the classic tubal pregnancy Numerous diagnostic errors are recorded In Case 1 we confused the unruptured gravid intramural process for a fibroid In Case 2 with uterine gestation in mind a colleague did two successive curettages to produce abortion.

Clinical development of interstitial preg nancy is analogous to that of the usual extra uterine gestations It may become arrested in its development as in Case 1 where a small intact ovum was found in the left horn of the uterus. Exceptionally interstitial gestation progresses unruptured to the fifth month

(case of Brindeau) and even to the seventh month (case of Bar and Buffnoir) Usually however, a rupture occurs toward the end of the second month resulting in either a massive peritoneal hæmorrhage (inundation) or an encysted hæmorrhage (hæmatocele) In Case 2, at about second month from date of last menstrual period, the patient experienced severe hypogastric pains and syncope and at operation the ovular sac was found ruptured, and there was a peritoneal hæmorrhage of moderate grade The average age of the patients is 32 years (Villette) for all kinds of ectopic pregnancy In our first case the patient was 26 years and in the second 42 years

ANATOMICAL CHARACTERS

Macroscopic anatomy of the uterus and ovular tumor presents variations in appearance, to which reference has already been made in the general clinical description of the two cases Alterations occurred in the opposite adnexa in 50 per cent of the cases. The tube and ovary may show every possible alteration Ordinarily the usual lesions occur consisting of peri-adnexitis and ovarian microcysts In our second case the adnexa presented the ordinary chronic inflammatory lesions. In the case reported the condition of the adnexa on the side involved appeared to be normal Histological study of this condition is extremely important and has been particularly stressed by Waegeli and by Vaudescal and others. Microscopical study of an interstitial gestation should include a study of the ovular cavity, uterine cavity both tubes, and both ovaries

The ovular cavity Thus is embedded in the musculature of the uterine wall The wall of the cavity consists of a thick, smooth muscular layer covered on the outside by peritoneum and on the inside by a connective tissue lining containing decidual cells. According to the majority of writers, especially Vaudescal, a slightly marked decidual reaction is found in interstitial gestation at the point of implantation of the ovum, exactly as is found in tubal pregnancy Certain authors—Martin, Beckmann, Simon, Webster, von Franque—state that a true tubal decidua is found about the walls of the sac which develops at the expense of the tubal mucosa. Other authors—Aschoff, Griffith, Kuhne, Poppel Futh and Ulesho-Stroganova cited by Vaudescal—deny absolutely the existence in interstitial pregnancy of decidual reaction of the periovular tissue, as is found in the tubal variety of ectopic gestation Popper believes that the absence of decidua is one of the characteristic histological findings in interstitial pregnancy According to the researches of Vaudescal glandular structures indicative of uterine or tubal mucosa are not found at any point

As the ovum hollows out its location in the uterine musculature, there develops an intimate connection between the chorionic villi and the muscular tissue of the wall of the sac (canalicular or intramural) Very often at places the chorionic villi deeply invade the uterine musculature producing fusion between the migratory ovular cells and the muscular fibers (Vaudescal) thus explaining the rupture of the sac. It is generally believed that decidual transformation of the uterine mucosa is present in interstitial as in all other forms of ectopic gestation (Kussmaul, Beckmann, Couvelaire. According to Vaudescal "the reaction of the uterine mucosa as in all extra uterine pregnancies is probably variable' In his researches this author found undeniable examples in which the uterine mucosa had not been transformed into decidua. Thus the integrity of the mucosa of the uterine horn and of the mucosa of the isthmic portion of the corresponding tube would permit the confirmation of an interstitial gestation.

Histological examination shows that the tubes and ovaries are normal on both the gravid and non-gravid sides

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ESSENTIAL HÆMATURIA

A Clinical Study[1]

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ESSENTIAL or idiopathic hæmaturia is a condition of renal bleeding the etiology of which cannot be determined. It is a clinical diagnosis which is offered when all the present known urological methods have been employed with negative results. The literature is full of theories as to its possible pathology even the most careful gross and microscopical studies of kidneys removed to save a patient from exsanguination have not yielded constant findings Many of these have been reported normal others have shown small isolated areas of chronic interstitial and glomerular nephritis (1) while other kidneys have had nothing but chronic passive congestion, due to obstruction of the urinary outflow or of the blood supply (2) or congestion secondary to cardiac lesions, to explain the hæmaturia Varices of the papillæ (Fenwick, 3) have been found on sagittal section of the kidney in some of the cases The theories of hæmophilia (4) and angioneurosis (5) have been offered as an explanation for idiopathic hæmaturia. Hunner (15) believes that ureteral strictures may play an important rôle, and E. L Young (16) regards obscure hæmaturia as a prenephritic symptom

It is quite evident that there is no one accepted explanation for a hæmaturia with negative urological findings. From a study of the kidneys removed at operation a single pathological entity cannot be made to apply in all cases it is quite possible that different factors are responsible. If there is no agreement as to the etiology of essential hæmaturia, clinically however we deal with this condition as a definite disease the diagnosis of which is always arrived at by exclusion.

It is important to have employed all the diagnostic methods at our command before venturing the diagnosis of essential hæmaturia. The patient should have a careful history and a general physical examination, which should include emphasis on the symptoms and signs of nephritis tuberculosis, and calculi of the urinary tract The bladder urine should be examined chemically and bacteriologically and phenolsulphonephthalein excretion estimated for a period of 2 hours. A Wassermann test of the blood should be done in all cases. The patient should be cystoscoped the ureters catheterized, and the urine from each kidney examined for pus and infection including an examination for tubercle bacilli A differential phthalein with the estimation of the phthalein excretion for 30 minutes the urea percentage, a plain roentgenogram of the renal ureteral and bladder region a pyelogram and uretergram of one or both sides must be part of the routine. In suspicious cases it may be well to pass a wax tipped catheter to rule out calculus.

If after all these investigations it is found that the patient has no urinary symptoms other than hæmaturia, the physical examination is negative for tuberculosis and nephritis, the urine free of pus cells casts and infection, the phthalein excretion within normal limits, cystoscopy negative except as a determining factor of the source of the bleeding, the urine from the bleeding kidney negative for pus and infection and with a normal function and the pyelograms negative, it may then be concluded that we are dealing with a case of essential hæmaturia One is never justified in making a diagnosis of essential hæmaturia when the examinations are incomplete or puzzling

This paper is a clinical analysis of 30 cases diagnosed essential hæmaturia (28 from the service of the Brady Urological Institute and 2 from the gynecological service of the Johns Hopkins Hospital) based on clinical studies of the cases and supplemented by

[1] Read before the Baltimore City Medical Society January 911.

conclusions drawn from the replies to a questionnaire The questions were framed to include the possibility of subsequent development of nephritis, urinary tuberculosis, calculi of the urinary tract, renal colic, operative procedures upon the kidney involved, and recurrence of hæmaturia A few of the cases have not been worked up as completely as one might wish and the explanation is that they belong to a period when urological investigation was not as thoroughly developed as now

In this series of cases patients have been followed from 1 month to 13 years, viz.

	Cases
Less than 1 year	4
1 to 2 years	5
2 to 5 years	11
5 to 10 years	9
Above 10 years	1
Total	30

Two-thirds of the cases are therefore represented as under observation for a period of less than 5 years, and one-third of them between 5 and 10 years.

Sex There are 24 males and 6 females in the series It would be unfair however to assume that essential hæmaturia is more common among men than among women as most of the cases were drawn from the Brady Clinic, where the majority of the patients are males

Age The ages of the patients when they first presented themselves for treatment at the Johns Hopkins Hospital vary from a minimum of 10 to a maximum of 71 years.

	Cases
Under 20 years	3
From 20 to 29 years	1
From 30 to 39 years	5
From 40 to 49 years	9
From 50 to 59 years	6
From 60 to 69 years	4
From 70 + years	2
Total	30

The age incidence of the actual onset of the hæmaturia as determined from the duration of symptoms is as follows

	Cases	Percentage
Under 20 years (6 16 19) approximately	3	10
From 20 to 29 years	4	13.4
From 30 to 39 years	4	13.3
From 40 to 49 years	11	36.6
From 50 to 59 years	3	10
From 60 to 69 years	3	10
From 70 + years	2	6.7

In more than one third of the cases the onset of the hæmaturia was in the fourth decade of life this represents also the period for the patients most commonly to present themselves for treatment. That blood should appear in the urine for the first time in eight cases between the ages of 50 and 70 is extremely interesting and most important for ruling out the presence of renal or vesical tumor The youngest individual in whom hæmaturia was noted for the first time was 6 years of age and the oldest 70 years Essential hæmaturia is not especially a disease of young individuals, as the onset of the bleeding occurred in only 7 cases before the age of 30 years.

Symptoms Essential hæmaturia is usually symptomless. In this series of 30 cases 13 the in 1 remaining 17 cases were free from symptoms.

Six cases (3 8 14, 20 21 23) had mild symptoms—pain in the back or lumbar region—which might have been ignored by the patient if not questioned about them Urinary symptoms were quite prominent in Case 14, and these may easily have been due to the accompanying prostatitis.

Four cases (11 17, 22, 25) of essential hæmaturia had suggestive renal colic at tacks during the period of bleeding These were undoubtedly the result of the passage of clots down the ureter

Glancing over the list of cases with symptoms one is impressed with the fact that periods of painless hæmaturia alternate with periods when symptoms accompany the urinary bleeding

Etiology The pathology of essential hæmaturia is still in dispute. Sex apparently is of no significance. Exertions and injuries play no important rôle though they are mentioned in three cases. In one (Case 29) hæmaturia developed after exercise. In another (Case 23) a blow on the right side of the back was followed by hæmaturia 10 days later, which subsequently proved to be coming from the left kidney In the majority of cases the hæmaturia developed spontaneously

Kidney involved The blood came from the right kidney in 17 cases (57 per cent) and from the left kidney in 13 cases (43 per cent) In no cases were both kidneys involved at least simultaneously These observations are in accord with those of most observers, who have reported essential hæmaturia as a unilateral affection of the kidney

Treatment The treatment of essential hæmaturia is an interesting phase of urological history With the advance of urology the treatment of these obscure hæmaturias has changed Before the technique of ureteral catheterization was perfected the therapeutic tendency was operative. Within recent years however intrapelvic treatment through the ureteral catheter has been the form of treatment generally employed for these conditions.

In reviewing the literature, one is at once impressed by the numerous claims advanced for the treatment and cure of essential hæmaturia The procedures have been operative and non-operative. In the former decapsulation, nephrotomy and occasionally nephrectomy have been employed In the non-operative the hæmaturia has often ceased with the mere passing of a ureteral catheter (Timberlake 7) or with the injection of adrenalin (Young, 8 Caulk, 9) silver nitrate (Geraghty Rytina, 6) or serum (Barringer 10) into the renal pelvis Sometimes the bleeding has stopped spontaneously At times the oral administration of calcium lactate the subcutaneous or intramuscular injection of horse serum or the employment of transfusion (11) has helped to clear up a stubborn case of unexplained origin Focal infections have been sought for and when removed have often caused a disappearance of the hæmaturia (Case 12)

Treatment is intimately bound up with remissions and cure and in essential hæmaturia it is indispensable to consider recurrences of bleeding along with treatment The literature is full of references to cures of an unexplained hæmaturia by some special form of therapy Too often the cases have not been followed for a sufficient length of time to judge of the efficiency of the treatment for patients with hæmaturia as is well known, have periods of hæmaturia alternating with periods of no bleeding that occur spontaneously It is well to bear in mind when any new suggestions for treatment are offered that they may represent a temporary cessation of the bleeding and not a cure. From the study of our cases we find that two of the patients (Cases 23 and 24) had recurrences for the first time after 12½ and 7 years respectively prior to which they were apparently free of hæmaturia We have thought it best to avoid claims for cure and have grouped our cases conservatively as Recurrences (Table II) and No Recurrences (Table I)

Of the series of 30 cases 5 had operative interference for the control of the hæmaturia (Table III) nephrotomy 3 cases, decapsulation 1 case, and nephrectomy 1 case. In the last case (28) the loss of blood was so excessive that a nephrectomy was done to save the patient's life. The postoperative improvement was marked the hæmoglobin rising from 25 per cent to 60 per cent. At operation an apparently normal-sized kidney was found On splitting it the pelvis was found filled with a blood clot. There was a gush of blood from the kidney itself showing that the vessels were intensely engorged. Both on the surface and on section the kidney looked normal. There was no gross lesion to account for the bleeding Microscopically the kidney showed nothing remarkable a few small collections of round cells were apparently the only pathological evidence

One of the patients (Case 26) had a decapsulation of the left kidney (New York surgeon) in 1911 For 5 years the urine was apparently free of blood In 1916 the hæmaturia recurred and there have been three recurrences since the operation

Three nephrotomies are included in the operative list In one (Case 27) the hæmaturia has as yet not returned over a period of almost 8 years but in the other two (Cases 24 and 25) recurrences occurred respectively 2½ and 5 years after the operation In these nephrotomies the kidneys were opened from pole to pole, but nothing grossly abnormal was discovered either in the renal parenchyma or in the pelvis In one (Case 25) however

TABLE I—CASES OF NO RECURRENCES OF HÆMATURIA

Date of Admission	Sex	Age in Yrs	Period of Hæmaturia	Symptoms	Clinical Findings — Kidney Involved	Treatment	Period Free of Hæmaturia	Present Urinary Symptoms	Present General Health	Present Age in Years
Feb 1913	♂	63	Painless hæmaturia for 2 months	Dull pain in right back	Right. Normal functions X ray and pyelogram negative	Pyelogram Hæmaturia ceased after pyelogram	7½ years	None	Good	70
Nov 1911	♂	77	11 months	Painless	Right X ray negative	Nephrotomy	7¼ years	Nycturia 2 – 3 times	Good	80
Mch 1913	♂	48	3 weeks	Slight pain under costal margin.	Right. X ray and urine negative	Spontaneous	6 years	None	Good	54
Aug 1917	♂	42	18 months	Painless hæmaturia Occasional pain left back	Right No infection, normal function X-ray and pyelogram negative	Pyelogram	2 years	None, except for occasional smarting on urination	Good	44
Oct 1917	♂	80	months	Painless Occasional pain in left lumbar region	Left No infection, no casts, normal function X-ray and pyelogram negative	Pyelogram Horse serum and AgNO3 (3 per cent) twice in left kidney pelvis	1 ½ years	None	Good	31
June, 1918	♂	63	1 week, 1910 1 week, 1911 8 months, 1918	Painless hæmaturia Nycturia once	Left No infection, no casts X ray and pyelogram negative except nephroptosis	Pyelogram	6 months	Nycturia 2–3 times	Good	64
Dec., 1919	♂	53	6 months constantly	Painless	Right No infection No tubercular bacilli X-ray and pyelogram suggestive of tumor.	Pyelogram Injection of pelvis with 5 per cent $AgNO_3$ and adrenalin, finally nephrectomy	6 months	None	Good	53
Jan 1919	♂	53	weeks in 1918 8 months in 1918	Painless Occasional pain after urination no glans penis. Occasional nycturia	Left. No infection, no casts, no tubercular bacilli X-ray and pyelogram negative	Pyelogram	6 months	Nycturia once Slight pain on urination	Good	53
Feb., 1919	♂	40	6 months constantly	Slight change in size and force of stream.	Right Normal function no casts, no infection, no tubercular bacilli X ray and pyelogram negative.	Complete distention of pelvis with 5 per cent $AgNO_3$.	4 months	None	Good	40
July 1919	♂	30	2 years	Some pain in right back 2 months ago	Right. No infection, no casts, no tubercular bacilli X-ray and pyelogram negative.	Pyelogram	3 months	Nycturia once	Good	30
Sept., 1917	♂	26	weeks	Painless	Left. No infection Good function.	Pyelogram. Horse serum, calcium lactate.	2½ years	None	Good	29
Oct., 1920	♂	20	Intermittent for 4 year	Occasional frequency Pain in back.	Left kidney urine negative no infection, bladder normal, function normal, pyelogram negative	Pyelogram. Urine clear 2 days later	1 month	None	Good	20

TABLE II.—CASES OF RECURRENCES OF HÆMATURIA

Date of Admission	Age	Sex	Period of Hæmaturia	Symptoms	Clinical Findings	Treatment	First Recurrence	Total Number of Recurrences	Latest Period Free of Hæmaturia	Period Under Observation	Further Treatment	Present Urinary Symptoms	General Health
Dec. 1906	3	M	18 months constantly	Pain during hæmaturia, slight pain in right back	Left kidney. No casts, good function, no infection, X-ray negative	Hæmaturia disappeared completely in 3 weeks after injection of adrenalin in pelvis of left kidney	2 years later	One (?)	Hæmaturia at the present time	3½ years	Passage of ureteral catheter hæmaturia persists	Hæmaturia. Pain in left lumbar region	Good
May 1909	24	M	Constant hæmaturia for 3 months	Painless, typical case	Left kidney	Hæmaturia disappeared after nephrotomy	5 years later	3	2 months	10 years	1st recurrence, AgNO3 pelvis, 2nd recurrence, AgNO3 pelvis, 3rd recurrence, spontaneous	Many typical cases, weekly, every few hours	Good
Sept. 1910	3	M	1910, month painless hæmaturia. Irregular intervals 1907–8, 3 months continuous	Painless. None	Right kidney. No casts, infection or albumin. Slight degree of renal impairment	Injection 1000 adrenalin in pelvis right kidney. Hæmaturia disappeared 10 days after discharge	3 years later		9 years	9 years	None	Many typical cases	Fair
Mch. 1910	3	M	Intermittent hæmaturia for 9 years. Constant hæmaturia for 4 months	Painless	Left kidney. No casts nor infection. Poor function. X-ray negative	Nephrotomy. Urine cleared immediately after operation	4½ years later	Intermittent for 5 years	2 months at present	9 years	None	Hæmaturia. Pain in left kidney typical	Bad
June, 1911	20	M	Constant hæmaturia for months	Painless hæmaturia. Dull ache in kidney and right loin	Left kidney. No casts, no tubercle bacilli. Good function. Pyelogram and X-ray negative	Complete destruction of left pelvis with adrenalin, urine clear 8 days later	1 day 7 years later		8 months	8 years	Intrapelvic treatment. Dull pain in small of back	None at present	Good
Jan. 1913	1	M	7 months continuous	None, except painless hæmaturia	Right kidney. Demonstrated function due to enlarged prostate. X-ray and pyelogram negative	5 per cent $AgNO_3$ 3000 adrenalin injected into pelvis 3 Horse serum 4 $AgNO_3$ injection into pelvis	2 months later		3½½ years	4½½ years	None	Many typical cases	Good
June, 1913	14	M	Hæmaturia 2 months in 1911, 4 months continuously	Frequency, nycturia, painless hæmaturia	Right kidney. No casts, albumin, no infection. X-ray and pyelogram negative	Urine cleared fifth day after injection of 5 per cent $AgNO_3$ into pelvis of right kidney	2 years later	6 months	2 years	4 years	4 per cent $AgNO_3$ injection of right pelvis for recurrence	Very frequently, some pain after micturition. Many typical cases	Fair
Sept. 1913	27	M	3 weeks, June, 1913	Renal colic in 1909. Painless hæmaturia	Right kidney. No infection, no casts, good function, pyelogram suggest pathol.	Injection 5 per cent $AgNO_3$ into right pelvis. Repeated 3 weeks later	1½ years later	2 weeks	1½ years	4 years	5 per cent $AgNO_3$ injected into pelvis right kidney for recurrence	None	Very good
May, 1916	26	M	Intermittent attacks 1911–13	None. Painless	Right kidney. No infection, no casts, good function good. Ther. sion and X-ray negative	Decapsulation in 1911. Recurrence in 1916. Horse serum used	1 year later	3	1½ years	3 years	$AgNO_3$ into pelvis	Many typical cases	Good

Sept., 1916	17	37	Attacks of renal colic. Hæmaturia 11 reks continuous	Painless. Nil turbid case.	No infection, some casts Thorium and X-ray negative Good function	Urine clear on examination.	8 months later	8	8 months	3 years	Injection of $AgNO_3$ 1917 to right kidney pelvis. Horse serum. Urine cleared afterward.	Nycturia once Some pain in bladder	Goo
Aug., 06	18	41	Intermittent for 10 years	Painless	No infection Right kidney No casts Pyelogram negative.	30 ccm horse serum also $AgNO_3$ and adrenalin into pelvis of kidney	6 months after discharge.	6	11 months	3 years	None	Nycturia once	Very good
Nov., 1916	3	43	Intermittent for 15 years.	Some pain in right lumbar region.	Right kidney No infection, no tubercular bacilli Tortuous dilated ureter	2 pyelograms after which hæmaturia disappeared.	1½ years later	1	7 months	3 years	None	Frequency every hour	Good
Jan., 1917	1	06	5-6 weeks continuous 1913 for two days.	Painless. None	Left kidney No infection, no casts Thorium and X ray negative.	Adrenalin injected left kidney pelvis 0.c.c. Horse serum $AgNO_3$ pelvis of kidney	1 year later	1 3 months	1½ years	2½ years	$AgNO_3$ injected left kidney pelvis.	None	Excellent
Nov., 1917	10	48	4 months intermittent	Painless	No infection, no tubercular bacilli X-ray and thorium negative Right kidney	Pyelograms	2½ years continuous bleeding.	Nil since Feb. 1, 1919	6 months	2 years	None	None	Good
Jan., 918	1	48	6 weeks continuous	Painless None	Left kidney No infection, no casts. Function good.	Urine cleared up after pyelogram within 3 days	4 days later		1 year 2 months	1½ years	June 7 1918, two teeth extracted.	None	Good
Oct 19 8	21	64	10 months continuous	Painless; pyeturia 4 to 5 times for 2 weeks	Left kidney N infection, no casts No tubercular bacilli X-ray negative Pyelogram showed calyces broader than normal	Hæmaturia disappeared after pyelogram.	1 week	Oct 1918 to April 1919.	4 months	1 year	None	Nycturia Frequency	Good
May 1909	29	46	Renal colic May 1908 Painless hæmaturia for 8 months	Painless	Left kidney No infection. Good function X-ray negative	Injection adrenalin left pelvis	No improvement in hæmaturia for one year	Intermittent	7 years	8 years	None		Dead October 1918.
Sept 909	30	44	Hæmaturia in 1906 for 5 days; intermittent hæmaturia for 4 months	Painless	Right kidney	Adrenalin right pelvis (twice)	8 months		3 years	6 years	None		Dead May 1915.

TABLE III.—OPERATIVE CASES

Case Number	Operation	Result
26	Nephrectomy Jan., 1919	Cured — 6 months
27	Nephrectomy Dec., 1911	No recurrence in 7½ years.
24	Nephrotomy July 909	Recurrence of hæmaturia 5 years later with two recurrences since.
23	Nephrotomy March, 1910	Recurrence of hæmaturia 2½ years later with five recurrences since. Bleeding at present.
20	Decapsulation, July 911	Recurrence of hæmaturia 5 years later with three recurrences since.

the operative note reads that the kidney substance was anemic with a suggestion of a mild chronic diffuse nephritis. No evidences of recent inflammation, calculi varices, or tumor were found. In all, the ureters were normal. Small portions removed at operation from each kidney revealed nothing but cloudy swelling Our nephrotomy results are at variance with those of Payne (12) who as late as 1913 wrote In not a single case reported in the literature has this procedure of simple nephrotomy failed to relieve this so-called essential hæmaturia.

The non-operative methods of treatment are varied. The more usual ones are intrapelvic injections, passing a ureteral catheter subcutaneous or intramuscular injections of horse serum and oral administration of calcium lactate Of these, the injection of adrenalin and of silver nitrate into the renal pelvis is the present method of choice Before reviewing our results of the non-operative treatment we desire to call attention to some interesting experiences in Case 4.

The patient was admitted to the hospital February 8, 1919, with a history of hæmaturia of 6 months duration, which was diagnosed essential hæmaturia of the right kidney after careful uro-

meters silver nitrate (5 per cent) were again injected through the ureteral catheter with no improvement. On March 3 10 cubic centimeters horse serum were injected subcutaneously still with no effect on the hæmaturia. On March 8, the pelvis of the kidney was completely distended with silver nitrate (11 cubic centimeters) For 2 days the patient bled profusely passing large clots, and he complained of pain in the lumbar region Soon, however the urine began to clear and on discharge, 12 days after the last treatment, the urine was clear and microscopically free of blood There has been no recurrence for 4 months

We have a suggestion to make in intrapelvic therapy for idiopathic hæmaturias. The mere injection of a fluid may not be sufficient to stop the urinary bleeding The fluid must often be made completely to distend or overdistend the pelvis until the patient begins to complain of pain in the lumbar region. As far as can be determined Braasch (13) was the first to use this method in essential hæmaturia.

In Case 4 two injections of 6 cubic centimeters silver nitrate had no effect on the bleeding, and it was not until the pelvis was completely distended with 11 cubic centimeters that the hæmaturia finally disappeared. We believe that the mechanical distention of the renal pelvis may produce a cessation of the bleeding in some of the essential hæmaturias. The distention must also be more than momentary, it must be kept up for a few minutes, best produced by plugging the distal end of the ureteral catheter This form of therapy lends itself to the recent descriptions by Quinby (14) of two cases of essential hæmaturia where the source of the bleeding was apparently just beneath the epithelium of the pelvis and papillæ. As stated before we believe that the pathology of the obscure hæmaturias is not constant for all cases, and that the etiological factors may be different in each group of cases. Hence, any suggestion for the control of renal hæmorrhage should be taken seriously and employed when methods already used have had no influence on the condition

The theory of pelvic distention is supported somewhat by an analysis of our cases In reviewing them we were struck by statements in the history that the patients often left the hospital, apparently after no treatment, with clear urine. A careful study of the charts however soon revealed that many of these patients had a pyelogram done in their routine examination. A pyelogram with gravity flow is really a distention of the renal pelvis. (In tables I and II pyelogram is meant to signify pelvic distention) It is quite possible that filling the pelvis with the pyelographic medium may have caused a cessation in some of the cases. It is extremely interesting to note that of the 12 cases with no recurrences the hæmaturia appeared to have subsided in 6 (Cases 1, 2 5 6 7 10) immediately or soon after no other treatment than the injection of some fluid into the pelvis for a pyelogram In cases with recurrences

there was a temporary cessation of bleeding for a varying periods after pyelography in 3 (Cases 12, 21, 22)

The mechanical distention of the renal pelvis is not advanced as a cure for essential hæmaturia, but is strongly advised in all cases where intrapelvic therapy is employed

Of 12 cases with no recurrences the following treatments were employed

	Cases
Pyelogram or pelvic distention	7
[illegible]	1
	1
	1
	1
	1

In these cases, 11 surely had no injections of silver nitrate and of adrenalin into the renal pelvis, and in 1 case the treatment was mixed and it is difficult to determine which form of therapy (pyelogram horse-serum, or injection of silver nitrate) actually caused the cessation of the hæmaturia Pelvic distention produced the best results, the urine being freed of blood in over 65 per cent of the cases with no recurrences.

Eighteen cases are grouped as recurrences. In 15 of these with the treatment given there occurred cessation of the bleeding immediately or within a short period in the hospital Two (Cases 24 and 25) had nephrotomies, and in 4 (Cases 13, 16, 17 for recurrences 18) the treatment was mixed In 14 cases where intrapelvic therapy was used (8 with apparently no distention—Cases 23, 24, 15, 26, 14, 11, 29, 30—and 6 with distention—Cases 17, 22, 12, 19, 20, 21), it is of interest to note that most of them cleared up within about 10 days For the first 2 or 3 days following such treatment the urine often became more bloody, accompanied by passage of clots Soon the urine began to clear, and within a week or 10 days the patient was discharged with urine macroscopically and microscopically free of blood The cases with no recurrences have responded about the same to intrapelvic treatments. In three (Case 12, pyelogram Case 19 pyelogram, Case 29, adrenalin), injections into the renal pelvis had no effect on the hæmaturia. In two cases (Cases 19 and 29) the urine continued bloody for respectively 19 and 12 months and then stopped spontaneously with no recurrences up to date. In Case 12 the extraction of two teeth with abscessed roots was followed by clear urine 5 days later in a hæmaturia which was continuous for 6 months after pelvic distention. There has been no recurrence for 14 months It is quite evident that most of the cases diagnosed essential hæmaturia that present themselves for treatment, improve rapidly under observation, particularly if pelvic injections are employed However, there is a strong *tendency toward recurrence within varying* periods In fact, the cases regarded as "no recurrences" will undoubtedly show blood in the urine if followed for a sufficient length of time. One patient (Case 23) was rid of his bleeding for 12½ years when it returned after exertion on the farm Others have not been so fortunate Two patients (Cases 12 and 21), whose urine cleared within 2 days after a pyelogram, had recurrences within 2 days and 1 week respectively In 4 cases (Cases 13 17 18, 30) the first recurrence took place within a period of less than a year, and in 9 (Cases 24, 15, 25 20, 14, 11, 26 22, 16) it occurred within a period of 1 to 5 years.

As the conclusions of this paper are based on the statements of the patients, it is quite possible that when a patient reports that his urine is free from blood it may contain microscopic blood not noticed by the individual. This happened in a case that is not included in this series In 5 cases (Cases 1 6, 8, 11, 12), however who reported their urine as clear, we had an opportunity to examine the urine and found it to be negative

The follow up period in no case of recurrence has been less than a year though there are 6 cases (Cases 1, 2, 4, 7, 10, 28) with no recurrences that have been under observation for 6 months or less The patients with recurrences have been followed from 1 to 12½ years, with an average of 5 years Ten cases (Cases 11 12 14, 15, 16, 19 20, 21, 22 23) have had but one recurrence There have been three with two recurrences (Cases 13, 17, 30) two with three recurrences (Cases 24, 26) one with six (Case 18) and

two (Cases 25 29) with intermittent attacks for varying lengths of time. At the time of writing there are but two patients (Cases 23 25) whose urine is considered bloody In ten patients (Cases 12 13 15 18 19 21 22 26 29 30) free of hæmaturia at the present time (including two cases—Cases 29 and 30—whose deaths occurred respectively 9 and 5 years after leaving the hospital) the bleeding of the recurrent attacks disappeared spontaneously without treatment In the remaining six cases (Cases 11 14 16 17 20 24) the recurrences were treated with intrapelvic injections, except Case 24 in which, in addition to these spontaneous cessation of the bleeding also occurred (third recurrence) The lesson to be learned from these studies is, first, that recurrences are frequent in so-called essential hæmaturia and secondly that the bleeding often disappears spontaneously

General health Of the 30 patients under consideration 2 have died (Cases 29 30) the first from pneumonia at the age of 54 years, 9 years after leaving the hospital and 8 years after the last appearance of blood in the urine the second was killed in an automobile accident 5 years after leaving the hospital and 4½ years after the disappearance of the hæmaturia The renal bleeding it is evident, was in no way responsible for the death of either patient.

Of the remaining 28 who are alive, the present health is described as good or excellent in 25 as fair in 2 (Cases 14, 15) and as bad in 1 (Case 25 a typical neurasthenic) Even in the 2 cases (Cases 23 and 25) whose urine is bloody at the present writing the general health is regarded as good in spite of the hæmaturia. It is indeed remarkable how little the general condition of the patient is affected by the presence of blood in the urine in these idiopathic hæmaturias Most of them are robust individuals, going about their business with no discomfort and no complaints other than the hæmaturia In one case only (Case 28) the loss of blood so threatened the patient's life that a nephrectomy was performed as an emergency measure. Ordinarily however the patients do not seem to be influenced by the bleeding and only occasionally do they develop severe anæmia.

Questionnaire An analysis of the questionnaires reveals the fact that none of the patients has apparently developed nephritis (absence of œdema and symptomatic headaches) and in those in whom it was possible to obtain a blood pressure reading it was found to be within normal limits (Cases 1 2 4, 6 8 12 21 23) and their urines, when examined contained no casts. None has had typical renal colic, and none has passed calculi. From the questions asked one is led to infer that urinary tuberculosis has not developed in any case of essential hæmaturia in fact, tuberculosis in no form has made its appearance. A renal tumor has apparently not developed subsequently in any case of essential hæmaturia not an individual has had an operation on the genito-urinary tract and only two (Cases 5 25) have come to operation (bottle operation for hydrocele, hæmorrhoidectomy and perineorrhaphy) at any time since the last treatment for the bleeding Urinary symptoms have been conspicuously absent. Nycturia from one to two times at night has been the most common symptom, and this is not particularly surprising when the ages of 8 of these individuals are known to be above 50 years. In 3 cases (Cases 14, 22 24) frequency has been present, the first two voiding every 2 hours and the last every hour during the day With these exceptions, and lumbar and back pains in some of the cases no urinary symptoms are noted.

Prognosis From our studies so-called essential hæmaturia appears not to influence the general health of the patient, nor does it seem to lead to disturbances of the urinary tract later on None of the patients under investigation has apparently developed nephritis renal colic, tuberculosis, nephrolithiasis, or renal tumor and none has come to operation for genito-urinary conditions. Patients have been followed for sufficient time for us to dare offer a prognosis It appears that we may give patients with hæmaturia, with negative urological findings a favorable prognosis and assure them that, as a rule, recurrences will not affect the general health

Only two deaths have occurred in our series and in neither of them has the cause of death been related to the hæmaturia. The question of prognosis in essential hæmaturia appears to be one of the main features of our studies In view of our findings it does not seem to us justifiable to advise a nephrectomy in the cases with intermittent hæmaturia over long periods. A nephrectomy should be employed as an emergency measure in those cases where life is threatened, or where loss of blood begins to produce definite signs of severe anæmia As for nephrotomy, we cannot say that the results have been striking (recurrences in 2 or 3 cases), and again, we must condemn nephrotomy on general principles, as we know that this procedure leads to marked destruction of the kidney Further, in one case of decapsulation there occurred subsequent hæmaturia after a period of no bleeding On the whole, the operative results have not been better than the non-operative findings. We strongly advise that non-operative therapy be given a fair trial, particularly the methods of intrapelvic therapy with pelvic distention

SUMMARY

1 The diagnosis of essential hæmaturia should be made only when all known urological methods have been employed with negative findings It is a purely clinical diagnosis, indicating renal bleeding of unknown etiology

2 This paper comprises the studies of 30 cases diagnosed as essential hæmaturia based on clinical studies supplemented by conclusions drawn from a questionnaire the questions of which were so framed as to include the possibility of subsequent development of nephritis, urinary tuberculosis calculi of urinary tract, renal tumor, operative procedure upon the kidney involved, and recurrences of hæmaturia.

3 In 36 per cent of the cases the onset of the hæmaturia occurred in the fourth decade of life

4 The bleeding in essential hæmaturia is for the most part symptomless.

5 In most of the cases the hæmaturia developed spontaneously Exertion does not appear to play a significant rôle in the origin of these hæmaturias

6 The right kidney was responsible for the bleeding in 17 cases and the left in 13 cases. In no case were both kidneys involved

7 The results of operative procedures have not been better than those of non operative methods. In our series there were recurrences after decapsulation and two nephrotomies. Nephrectomy is the only operation ever indicated, and that only as an emergency measure to save a patient from bleeding to death and not as a routine measure for intermittent hæmaturia over a long period

8 The non-operative methods have been used with success. These have consisted of intrapelvic injection of silver nitrate and adrenalin and of the passage of a ureteral catheter, the oral administration of calcium lactate and the subcutaneous or intramuscular injection of horse-serum Of these the intrapelvic methods have given the best results and it is of interest to note that in a large number of the cases of the series the urine had become clear within a week or 10 days after this form of treatment.

9 It is suggested that the pelvis of the kidney be completely distended with fluid whenever intrapelvic injections are employed That distention is an important factor in this therapy is shown in many cases in which the hæmaturia has temporarily disappeared after the injection of an opaque medium for pyelographic studies.

10 The 30 cases have been followed from 1 month to 12½ years. There have been 12 cases with no recurrences of the hæmaturia, and 18 cases with recurrences Of the latter there are 2 whose urine is bloody at the time of writing It is not safe to predict cures.

11 Spontaneous cessation of the bleeding occurs frequently in essential hæmaturia.

12 The general health is usually not affected by the loss of blood in essential hæmaturia.

13 From an analysis of the questionnaires, we can easily infer that none of the patients has developed nephritis, renal or ureteral calculus, tuberculosis in any form, or renal

tumor and none has had an operation on the genito-urinary tract

14 Prognosis in essential hæmaturia is favorable in spite of the loss of blood and the recurrences of hæmaturia.

I desire to express my appreciation to Drs H. H.

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OBSTETRICAL PARALYSIS OF THE PERONEAL NERVE[1]

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PARALYSIS of the peroneal nerve from pressure upon the main trunk of the sciatic nerve in its intrapelvic portion is a comparatively rare condition It occurs *during prolonged or difficult labor either* from direct pressure from a large head in a small pelvis, or from trauma by application of forceps. It may have occurred in a larger number of cases than have been reported, as it may easily be confused with the paralysis caused by direct pressure upon the peroneal nerve as it winds about the head of the fibula, which in a transient form is common in obstetrical or gynecological cases, where leg holders have been used

One might expect to find the condition described in textbooks upon obstetrics, neurology and orthopedics On looking over the standard works upon these subjects however I have found the condition scarcely mentioned. Shears (1) says Obstinate paralysis may result from pressure on nerves that pass over the pelvic brim DeLee (2) does not mention it at all. Hirst (3) refers to the condition, but indefinitely and says that the prognosis is fairly good Edgar (4) simply speaks of the 'general outlook being favorable Starr (5) does not include it among the causes of injury to the sciatic nerve Whitman (6) Bradford and Lovett (7) Taylor (8) Tubby (9) and Redard (10) do not mention the condition.

Among the monographs upon the subject I find the following references. Howell (11) *reports three cases in which curiously enough* he states that the onset of the paralysis did not occur until the sixth second and ninth days, respectively All were prolonged labors Two cases were primiparæ the other an instrumental delivery There were no recoveries.

Gordon (12) reports two cases of which he does not give the outcome. Thomas (13) does the same. The earliest reference found is that of Bianchi (14) who says 'These rare paralyses usually follow difficult and prolonged labor in which the fœtus presents by the vertex and has to be extracted with forceps. The paralysis is almost always unilateral and limited to the distribution of the sciatic nerve. It may be temporary incomplete or persistent. The majority of the other authors (15) report isolated cases and say little about differential diagnosis or ultimate outcome.

The following case is therefore reported as the patient has remained under observation for more than a year

She was first seen by me at The Hospital for the Ruptured and Crippled, Clinic of Dr Royal Whit

From the Hospital for the Ruptured and Crippled, Clinic of Dr Royal Whitman

man, January 1920 S S Hebrew married age 43 chief complaint, paralysis of the left foot Patient has been married 17 years and has seven children alive and well, two stillbirths Previous labors were always easy Patient was in perfect health up to the time of last labor Her present illness dates from 11 weeks ago Labor pains began on a Friday night and continued until Sunday morning when at 10 o clock forceps were applied and the child delivered with considerable difficulty It weighed 10½ pounds, and its head was much lacerated. Immediately on her return to bed the patient was conscious of great pain in both legs, and inability to move the left foot. The pain gradually wore off and on the eighth day postpartum she attempted to get up, but was unable to walk because of the foot giving way under her Since then she has been doing her work supporting herself by clinging to furniture About 1 month ago the power began to return to the flexors of the toes and the calf muscles, which have steadily been growing stronger No disturbance of sensation has been noticed at any time no chills or fever followed

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is negative On the left side there is drop foot resulting from complete paralysis of the extensors of the toes the tibialis anticus and posticus, and the peronei. The flexors of the toes and calf muscles are apparently normal. The reflexes are normal on both sides. There is no disturbance of pain or temperature sensation, superficial or deep Motions of both hips are free and painless There is no sign of injury to the sacro-iliac joints or to the pelvis

The diagnosis lay between two possibilities. (1) Injury to the main trunk of the sciatic nerve, where it crossed the pelvic brim, either by the infant's head or by the forceps (2) Injury to the peroneal nerve, where it winds about the head of the fibula from compression of the strap in the leg holder

The second injury is by far the more common In my opinion the evidence against it was that the tibialis posticus was paralyzed, thus evidencing injury to both trunks of the sciatic nerve This opinion was supported by the history of complete paralysis below the knee, with subsequent improvement of all muscles supplied by the internal popliteal division except the *tibialis posticus* One might also expect, had the paralysis been confined to the single group of muscles supplied by the peroneal nerve that during the 11 weeks following the injury there would be at least a tendency to the deformity of equinovarus Such, however, is not the case Granting therefore that there may have been doubt as to whether or not the tibialis posticus muscle was at that time paralyzed, the patient s history of original complete paralysis below the knee, plus the absence of any muscular contraction point to the original injury having been to both trunks of the sciatic nerve

The patient was given a brace with a right angled stop joint at the ankle and baking massage, and passive motion were instituted. She took these regularly until October 1920 The gait improved steadily due to her increased facility in wearing the brace but no muscular improvement whatever was noted She was therefore referred to Vanderbilt Clinic to the clinic of Dr Louis Casamajor for a confirmatory neurological examination. The following report was received from Dr Hubert Howe I wish to report the neurological findings in the case of Mrs S S the patient whom you referred to the Vanderbilt Clinic. She presents a typical picture of paralysis of the external popliteal nerve on the left side. The findings are briefly as follows The gait is steppage the knee being raised high and foot dropped As the foot is planted on the ground the arch is flattened, due to paralysis of the tibialis anticus. Dorsiflexion of the foot and extension of the proximal phalanges of the toes cannot be performed, which denotes paralysis of the extensor longus and brevis digitorum and extensor proprius hallucis. Abduction of the foot is impossible as the peroneus longus and brevis are paralyzed There is subjective tingling in the

and pain on pressure over the nerve trunk are present

Dr Howe speaks of regeneration taking place Such regenerative processes, however must be exceedingly slow, as no improvement from the standpoint of muscular action has been demonstrable in 15 months

The differential diagnosis between intrapelvic and extrapelvic injuries of the peroneal nerve will always be difficult. The crucial point in this case was whether or not the tibialis posticus was paralyzed a point upon which I regret that Dr Howe did not express an opinion The weight of published opinion is that paralysis during parturition from

pressure of the forceps, or of the head in the contracted pelvis regularly gives rise to paralysis of the external popliteal nerve alone Various theories have been advanced to explain this the most plausible being that the fibers composing this nerve lie directly upon the bony brim of the pelvis, while the other branches of the plexus lie upon the pyriformis muscle If this opinion be true the differential diagnosis must rest entirely upon the history In this case the history showed (a) pain in both legs (b) original complete paralysis below the knee, with subsequent rapid recovery of the muscles supplied by the internal popliteal division of the sciatic.

From a consideration of this case therefore, one would conclude that

1 In any paralysis below the knee occurring after prolonged, difficult labor or instrumental deliveries, the possibility of intrapelvic injury to the sciatic nerve should be borne in mind

2 An immediate orthopedic and neurological examination should be made with a view if possible, to establishing the differential diagnosis

3 Apparatus should be immediately applied to prevent deformity and to enable the patient to get about with the maximum facility

4. The prognosis as to ultimate recovery should be exceedingly guarded.

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CONGENITAL OCCLUSIONS OF THE INTESTINES

WITH REPORT OF A CASE OF MULTIPLE ATRESIA OF THE JEJUNUM

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AND
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THE subject of this paper was suggested by a case recently encountered by Dr Davis in his practice From an examination of this case and a review of the literature on the subject it has seemed worth while to make a somewhat detailed study not only on account of its interest from the standpoint of congenital pathology but because of its importance as a clinical problem

HISTORICAL

As a basis for this study and conclusions we have collected from the literature 392 cases of congenital occlusion of the intestines between the pylorus and anus The earliest case discovered was that by Calder (1733) who described an atresia of the duodenum and the first exhaustive review of the subject was made by Theremin (1877) Since Theremin's work a number of extensive papers have been written and the accumulated cases examined The following deserve special mention Louis Cordes (1901) presented an analysis of 57 cases of duodenal obstruction Kuliga (1903) collected 189 cases of congenital occlusions of the intestinal tract and examined particularly the question of etiology, Spriggs (1912) reported 24 unpublished cases and reviewed the literature, his paper is to be especially commended for the careful microscopic studies which it records

It is very difficult to form an estimate of the frequency of the condition Theremin's observations at St. Petersburg so frequently quoted in which there were 9 cases in 150,000 children show no close agreement with the Vienna statistics in which only 2 cases were found in 110 000 children Miller (1894) found 36 cases of atresia and stenosis in 65,000 autopsies of children at Moscow Ernst (1916) found 2 cases reported in 41,000 births at the Lying in Hospital of Copenhagen Durante (1901) reports 6 from the Maternité of Paris in one year Apparently imperforate anus is four times as frequent as other intestinal atresias, it is entirely possible, however that the discrepancy between the two conditions is one of diagnosis rather than a greater frequency of the developmental defect at the junction of the rectum and anus

There seems to be no point along the intestinal canal where atresia more or less constantly appears Even in as short a segment as the duodenum, the lesion may be at any point, and in only about 18 per cent is it opposite the papilla. The following table arranged in more or less arbitrary divisions illustrates the positions of atresia in the series we have studied

	Cases
Duodenum above papilla	59
Duodenum below papilla	75
Jejunum	60
Ileum and cæcum	101
Colon	39
Multiple atresia	67

Of the multiple cases slightly more than 50 per cent consist of from 2 to 9 occlusions in the jejunum and upper ileum, 20 per cent are in the small intestines and colon while the remainder are scattered Apparently about 15 per cent of all cases are multiple, and frequently stenosis occurs in addition to the atresias If we add the multiple cases of the jejunum to the single lesions of the same region it will be noted that occlusion of the jejunum is relatively as common as that of the ileum This would seem to oppose the frequently repeated suggestion that congenital atresias are due to developmental errors of the vitelline duct and ileocæcal valve

CLINICAL PICTURE

This can best be described by detailing the history of our case.

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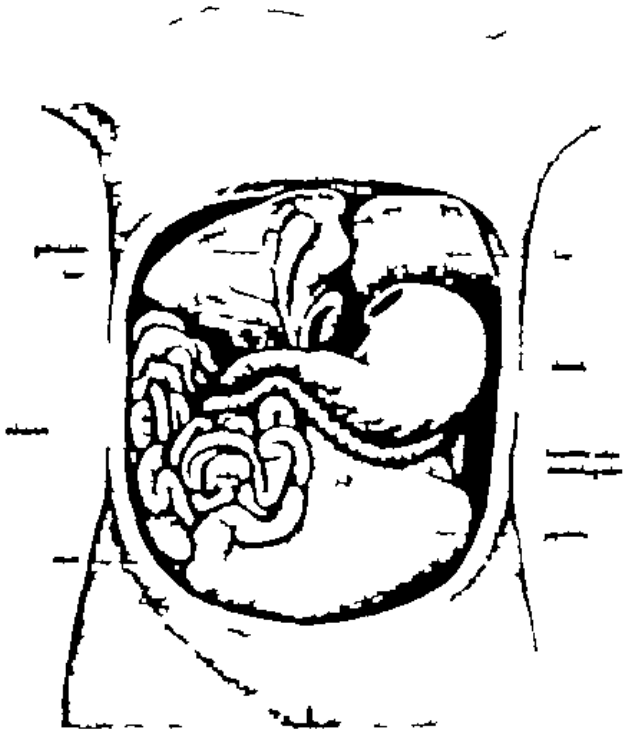


Fig. Shows the mcera in the abdomen. The widely dilated jejunum occupies the left and mferor regions this contracts suddenly and ends in a blind tube at *a*. The multiple occlusions are on the right. The contracted *transverse colon with no great omentum lies just below* the stomach

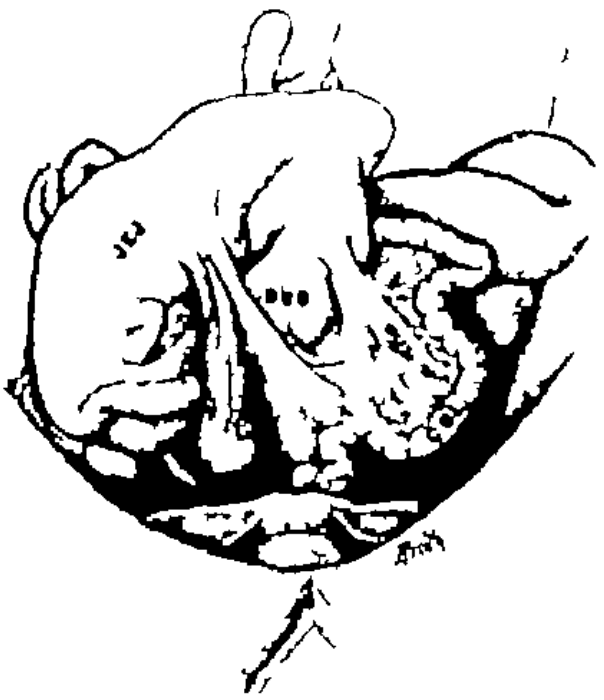


Fig. 2. Same as Fig. 1 except the dilated jejunum *Jej* is reflected up and to the right to show the dilated duodenum, *Duo* and the band of adhesion attached to the jejunum

mal. The parents, late in young life, were apparent ly free from constitutional diseases. A sister 10 years old was normal.

History. The first 48 hours the babe seemed nor mal. The first few nursings were retained; urine was voided regularly and there was a passage from the bowels. The bowel movement was not ex amined but it is certain from the later examination of the bowel contents that it was made up of mucus and cellular débris with entire absence of bile. Emesis was first observed about 60 hours after birth and continued to occur immediately fol lowing any gastric intake; all efforts to produce a bowel movement failed.

Examination. On the morning of October 26 Dr. S. E. Jacobi attending called Dr. Davis in consultation. Infant appeared poorly nourished with facies of irritation and distended abdomen. Catheter could be passed for a distance of 8 to 10

that an obstruction existed here. It is probable that the contracture of the colon prevented higher introduction of the enema.

Diagnosis. Congenital obstruction of small in testine, probably near ileocecal juncture.

Operation. Near noon, October 26, under local anesthesia, right lower abdomen was opened

external enterostomy was made to this distended end from which there was free drainage of chylous fluid mixed with castor oil administered by mouth a day or two before.

Postoperative course. After returning to bed water was taken freely without emesis, but 6 hours lat

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the pylorus.

The jejunum is much dilated, 30 centimeters, and thick walled for a distance of 16 centimeters, then *suddenly contracts to normal diameter*, makes an acute flexion on the dilated portion but without stenosis, continues for a short distance and ends in a blind pouch. After a short hiatus there is a seg ment, blind at both ends, 9 centimeters long. Other segments of varying length follow: 6 centi-

meters, 2 centimeters, 1 centimeter 15 centimeters, 17 centimeters. Between some of these segments there is a deep notch cut in the mesentery while other spaces show the mesentery intact and with a thin border All of the segments of intestine are of normal diameter except the fourth which has a diameter of about twice that of the normal When examined for total length it is evident that about one third of the jejuno-ileum is lacking being represented in the spaces between the blind segments The ileum and colon are normal except the latter is contracted to appear almost worm like, it dilates readily under water pressure (Fig. 1)

There are no peritoneal adhesions except a small band from the proximal dilated jejunum to the dorsal wall This is represented in figure 2 The mesenteries are normal in position and development and contain no points worth note except in the regions of the atresias there are many enlarged lymph nodes The mesenteric arteries are normal in pattern and distribution

Microscopic examination All viscera are normal except the intestines. The duodenum and jejunum up to the point where it ends in a blind pouch Figure 1 *a* show the effect of dilation in

but the muscu

This condition

is probably an hypertrophy due to the obstruction It has been noted in a number of cases. Ducros (1895) and that in one third of his cases there was hypertrophy of the wall above the occlusion Spriggs (1912) thought that this thickening was a serous infiltration In our case however there is no question but that there has been a large increase in the muscular elements.

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velopment There are however many cases on record in which the distal bowel is underdeveloped and very probably to such an extent that it would be incapable of functioning if the occlusion were successfully eliminated

The contents of the blind segments is mucus, epithelial débris many small round cells and a few red blood cells.

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pathological emb

fields look like postmortem changes but we can be reasonably certain that they are not because no such changes appear in other portions of the canal (Fig 4) This cellular degeneration belongs to the mucosa which in many places can not be distinguished from the contents of the canal Kuliga (1903) and Spriggs (1912) observed in their cases that the mucosa was most markedly degenerated The muscularis mucosa is undergoing the same degenerative process but to a less degree. The muscular coats are well differentiated but show atrophy and hypoplasia the muscle fibers are small and irregular and the nuclei much contracted and deeply staining

In all but two segments the canal ends blindly with all layers present and no indication of a scar In two segments or rather in the space between two segments of intestine muscle fibers are present in heterogeneous arrangement in the border of the mesentery This muscle seems to be continuous with the outer muscle coat of the intestine. There is no suggestion of a lumen (Fig 5)

There is lymphoid infiltration throughout the mesentery and the lymph nodes are enlarged but in our opinion this condition is to be related to the degenerative process rather than to bacteriological reactions There is no evidence at any point of a folding twisting, or other disarrangement of the mesentery

We have already noted that the arteries appeared normal on inspection but when examined in microscopic sect[illegible]

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have just

drawing the normal arteries are shown in relief in the mesentery while the sclerosed vessels are represented by black lines. All of the arteries in the atresic region show some sclerosis. The process seems to be primary in the smaller radicles. Figure 7 shows a large artery in the margin of the mesentery its walls are greatly thickened and the lumen small The smaller arcades and particularly the terminal rami of the free mesenteric border are occluded by an overgrowth of cells which seem to be derived from the endothelium Figures 8 and 9 show the occluded rami We have found no other case reported in which this condition of the arteries has been described but since so few have been carefully studied microscopically it is probable that the condition is not so rare as this statement would indicate. It is unprofitable to speculate as to what caused the local sclerosis, but it seems certain that this case cannot be classed with developmental anomalies.

There are certain points in which our case did not correspond to the more commonly recorded clinical picture which may be profitably considered

Vomiting is almost always present and generally begins on the second day, Helmholz (1907) reported no vomiting but the child lived only 48 hours Vomiting of blood is often recorded and frequently appears with the first emesis The exact cause of the hemorrhage has not been determined Cowell (1912) reached the conclusion, that ' In most cases the gastrorrhagia is mechanical in origin resulting from the strain of vomiting on an



Fig 3

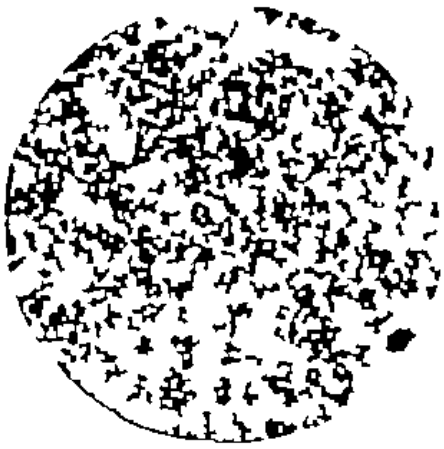


Fig 4

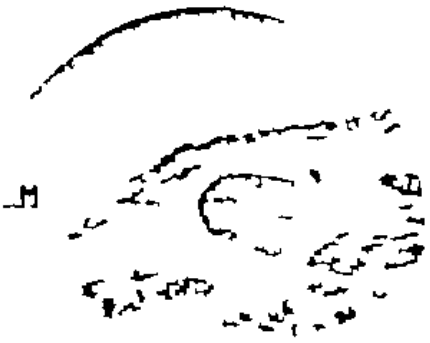


Fig 5

already overdistended stomach Bile may be vomited even when the obstruction is above the papilla and can only be explained on the basis of an accessory bile-duct. (Cordes, 1901)

Constipation is usually complete when the obstruction is below the bile papilla but a little greyish mucus may be passed as in our case. If the obstruction is above the papilla scanty green motions are generally recorded

In a few cases a slight icterus has been observed at birth Savariaud (1903) thinks it is due to hypertension in the biliary tract We are under the impression that icterus is not present in a larger proportion of these cases than in normal newborn infants

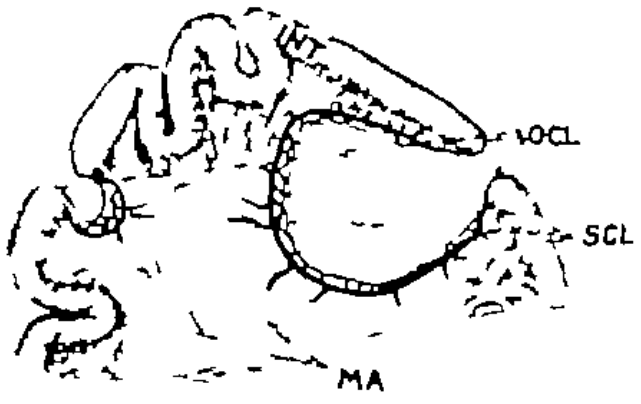


Fig. 6 Drawing to show a segment of intestine, *mt* the mesenteric blood vessels, *ms* and the position of the sclerosis indicated by the heavy lines, *sd*

Anuria has been reported in some cases but no cause has been suggested

ETIOLOGY

In discussing the question of etiology it is important to recognize the dissimilarity of many of the cases. The atresia varies from a simple diaphragm occluding the lumen of the canal to multiple defects of considerable extent, as in our case. The time of occurrence of the lesion is variable Many cases with the occlusion below the opening of the bile duct contain normal meconium in the distal bowel, which shows that the obstruction was formed after the third month other cases with the lesion in the same position show a total absence of bile in the bowel content and would argue for an earlier operating cause

Developmental errors Arrest of development as a cause of intestinal occlusion was first suggested by Meckel (1812) who was under the impression that the intestine developed in segments In 1890 Filimowski and Tandler both found that human embryos between the ages of 4 and 10 weeks show an overgrowth of epithelium in the duodenum which causes for a short time an occlusion of the canal They concluded that this condition might persist and so be the cause of duodenal atresia. Forssner (1907) restudied the question and agreed with the above investigators in their conclusions he however



Fig 7



Fig 8



Fig 9.

Fig 7 Photomicrograph of a section of one of the larger sclerosed arteries showing the thick wall The smaller arcades are occluded by an overgrowth of cells which seem to be derived from the endothelium

Fig 8. Photomicrograph of a mesenteric artery and vein showing the occlusion of the artery by an overgrowth of the endothelium.

Fig 9 Photomicrograph of a smaller artery showing sclerosis and complete obstruction of its lumen by degenerating endothelium.

went a step farther and suggested that the same condition of overgrowth of epithelium might occasionally occur in other portions of the canal and so account for occlusions found elsewhere than in the duodenum Schridde (1908) denies that the duodenum is ever entirely occluded during development. Granting that occlusion normally occurs during development it is difficult to make this fact explain the extensive defects sometimes found in the duodenum and much more those of the jejuno-ileum and colon

Bland Sutton's (1889) theory that occlusions occur at the site of an 'embryological event,' while very satisfactorily accounting for imperforate anus and occlusion at the bile papilla, is not borne out by a study of the distribution of lesions in this series of cases The statement has frequently been made that these cases are developmental errors because of the large number of other anomalies which are found in association Such a statement is an error, for in our series there is less than 0 5 per cent of the children showing anomalies, on the other hand the absence of other anomalies is not necessarily an argument against developmental disturbance since all of the more recent experimental teratology shows that there is almost entire independence of lesions. In a certain proportion of our series there is undoubted evidence of developmental disturbance but what the factors are or how they operate to produce atresias can at the present, be only a matter of speculation

Developmental accidents Many of the Continental writers have concluded that the condition is due to *Acksendrekung* which may be considered as volvulus Since various late stages of congenital volvulus have been observed it seems entirely reasonable that this accident is responsible for a number of cases Gaertner (1883)

Intussusception has been urged by Braun (1902) and Chiari (1903) as the cause of congenital atresia In the cases which they studied there seems to be no question of the correctness of their conclusions but it is difficult to conceive of this process, or volvulus, acting without disturbance of the anatomical arrangement of the mesentery, which is normal in so many cases

Strangulation of a loop of intestine at the navel or some other point is without question the cause of a number of cases (Clogg 1904)

Fœtal pathology Peritonitis as the cause of these anomalies was first suggested by Fiedler (1864) who thought that, aside from the atresia, the condition might be so far recovered from as to leave no evidence at birth This view has been quite widely accepted A small proportion of this series shows peritonitis still active or evidenced by old adhesions. Enlarged lymphatic nodes in the mesentery are frequently reported, but

it is entirely possible that these are secondary to occlusion of the bowel It is difficult to understand how peritonitis could produce wide defects in the bowel with blind ends showing no scar then too it is contrary to observation that adhesive bands should draw across a gut so as to sever it in the way that must occur if we are to consider peritonitis as the cause of these cases It is our opinion that this series of cases offers very little evidence in favor of the inflammatory hypothesis of congenital atresia

In a certain number of cases ulceration of the bowel has been found and bacteria have been recovered from the site of the atresias If an ulceration occurred early it might heal leaving only an occlusion at birth With our present knowledge of fœtal pathology no exact statements can be made but in cases like that of Markwald (1894) and others microscopic examination strongly supports the view that some factor has caused a degeneration of the mucosa. Our case seems to indicate that *the primary lesion is in the arteries causing a sclerosis and that the degeneration of the mucosa is secondary to this sclerosis*

DIAGNOSIS

The simple fact of intestinal obstruction presents little difficulty The exact point of obstruction is extremely difficult to determine A review of the clinical notes on this series shows that the tendency is to locate the lesion too low in the canal The presence of bile in the stool or vomited matter may throw some light on the situation of the occlusion too much weight, however should not be placed on these findings, for Cordes has shown that an aberrant duct may open above or below the atresia A late occlusion will show bile in the distal bowel, as a considerable number of cases testify It is impossible to recognize multiple atresia therefore the most that can be expected is a diagnosis of congenital occlusion

PROGNOSIS

The prognosis of congenital atresia is absolutely bad unless the block is overcome The average age at death is 6 days there is a slight variation of the time depending on the location of the lesion the age for duodenal atresia being 5 days and for the colon 8 days Keith (1910) reported a case of duodenal atresia which lived 9 months, von Tischendorf (1887) and Theremin (1877) cases of occlusion of the lower ileum which lived 3 weeks Gruneberg (1899) a block of the descending colon which died at 7 weeks. While this series shows only two cases of recovery through treatment we feel that in the future there should be a chance for a larger percentage of cures

TREATMENT

Obviously surgery offers the only hope of cure. yet less than one third of this series was subjected to laparotomy

All cases reported to date where an external enterostomy has been done as a temporizing measure have resulted fatally The most favorable case was that by von Tischendorf (1887) which was operated on on the seventh day and lived for 15 days

Entero-anastomosis shows more favorable results. Fockens (1911) did an entero-anastomosis for atresia of the lower ileum on an 8-day child and Ernst (1916) did a duodeno-enterostomy for duodenal atresia on an 11 day old child both cases recovered Franke's (1898) case of entero-anastomosis functioned but unfortunately a stitch broke and it died on the third day of peritonitis In certain cases in which entero-anastomosis was practiced with unfavorable results it was discovered at autopsy that meconium had not penetrated into the contracted distal bowel. This fact has led Clogg (1904) to suggest that the contracted bowel should be distended by water pressure at the time of the operation Of course the anastomosis should be the most favorable possible compatible with physiological and surgical principles

From this series of cases and our single experience we are influenced to make the following suggestions.

Operation should be undertaken immediately following the diagnosis, provided of course, that the infant is not suffering from some other condition which contra-indicates treatment for the atresia

The anæsthetic to be employed is manifestly procaine infiltration. Spinal anæs-

thesia is not suitable nor is paravertebral *justifiable, while either, either by* inhalation or by rectum, is distinctly contra indicated

The incision must be long enough to discover all occlusions for 15 per cent of these cases are multiple.

The operation to be performed is an entero-anastomosis either as a lateral or an atypical end to-end union

Undilatable and undeveloped distal bowel and widely scattered multiple occlusions are contra indications to operation

SUMMARY

Congenital occlusion may occur at any point in the intestinal canal In 15 per cent of this series it is multiple

The condition is relatively rare it occurs once in about 20 000 infants.

There is no one cause for all of the cases The various etiological factors may be summarized under the following heads developmental anomalies, developmental accidents fœtal diseases

Prognosis is bad

Treatment should be an entero-anastomosis performed as early as possible

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PERFORATIONS OF THE ŒSOPHAGUS

Report of a Case of Transpleural Œsophageal Fistula

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A PATIENT has recently come under our observation in whom, following thoracotomy for pyopneumothorax ingested food was discharged through the thoracic drainage opening This œsophageal fistula, after persisting for one year healed spontaneously In placing this case on record, we have reviewed the various conditions in which the œsophagus has been found perforated into the mediastinum air passages or pleural cavity

Lincoln L age 15 referred by Dr R W Dawson Redford Michigan to whom we are indebted for the pre-operative notes

Family history is negative. There was a vague history of quick consumption in a great aunt 9 years before the birth of the patient Both parents are alive and well. He is the youngest of five healthy children The patient though always somewhat frail had been well and of normal growth until his present illness He had had measles at 10 chicken-pox at 11 whooping cough at 14, and paratyphoid fever of 1 month's duration at 14

Present illness On January 22 1920 during the severe influenza epidemic he came home from school complaining of a chill and feeling sick He had been perfectly well the day before On January 23 one day after the onset of the illness, there was a temperature of 104 and soon signs of right-sided lobar pneumonia developed For the first 5 days of the illness, he vomited continually generally 5 or 10 minutes after taking food The vomitus was often greenish (bile) It ceased abruptly on the fifth day The temperature remained continuously high (103–104°) for a week with respirations 30 to 34 per minute and then the fever dropped to 100–101 the respirations still remaining high (30 average) For the next month there was an evening temperature of 101–102 but the patient seemed comfortable except for rapid respirations The physical signs of consolidation in the right lower lobe persisted

On about March 1 he began feeling a sense of fullness in the mid-sternal region on swallowing and this became gradually worse. After a few days there was continual soreness in the mid-sternal region He could drink liquids, but any solid food caused severe pressure pain The temperature which had become normal for 2 days, rose to 103

On March 9, while eating breakfast, he suddenly vomited about a tablespoonful of foul pus, and became so asphyxiated that the mother thought he was dying One half hour later he vomited a cupful of the same foul pus This brought immediate relief There was no further dysphagia, he was comfortable, and temperature became lower

Dr Hugo Freund saw the patient the next day Breath sounds over the right lung were everywhere absent and expansion was limited on that side Succussion splash was heard in the right thoracic cavity on moving the patient quickly

Patient was admitted to Harper Hospital, March 10, 1920

X ray on March 10 confirmed the diagnosis of pyopneumothorax. The fluid extended to the top of the fourth rib in front and could be seen under the fluoroscope splashing in the partially air-filled thorax The mediastinal contents were displaced to the left (Fig 1)

Operation March 11 Dr Ballin A three-inch incision was made in the right retro-axillary line with removal of 2 inches of the right seventh rib Foul smelling air escaped under pressure together with some cloudy serum. For 3 or 4 days the discharge was very scant. Then the discharge became profuse and had an odor of butyric acid fermentation Microscopic examination showed yeast cells and bacillus butyricus. Milk was suspected of being present in the discharge.

March 19, there was an odor of coffee to the discharge. Particles of food were noticed in the dressings, and after this, the amount of food in the discharge steadily increased

March 21 X ray and fluoroscopic examination persisted for several weeks The food discharge was so alarming that starvation threatened. Gastrostomy was considered but a Rehfuss tube was introduced and the patient fed entirely through it for 3 weeks.

May 9 he was discharged from the hospital There was moderate drainage, still containing some food particles He had gained weight and felt comfortable. Temperature, still present had fluctuated irregularly since operation about 101 pulse 120 X ray now showed some dilatation of the œsophagus at the site of the lesion. Less of the barium escaped via the perforation

Subsequent history Temperature continued until the middle of June i.e. for 6 months after onset of



Fig. 1 March 10 1920 right pyopneumothorax (before operation) Developed during a pneumonia of 6 weeks duration Dysphagia and sudden vomiting of a large amount of pus preceded the pneumothorax.



Fig 2 March 21 1921 Taken 10 days after thoracotomy Shows escape of bismuth from œsophagus—transpleura—along the collapsed lung collecting in right costodiaphragmatic angle and escaping through the drainage tube

illness. It was 100–101° in the evening normal in the morning. X ray on May 21 showed a very small quantity of barium escaping through the fistula

July 7 only thin fluid barium escaped via the perforation and then only when large gulps were swallowed With small quantities or a thick mixture there was no leakage There was dilatation above the perforation and also pronounced cardiospasm—barium was retained in the œsophagus several minutes. At this time there was noted some expansion of the upper portion of the right lung

When seen on August 12 there was moderate discharge which was frequently coffee-stained or contained other ingested liquids. Patient was pale with rapid respirations but was improving in strength and gaining in weight

X ray November 16 showed a very slight trickle of barium into the pleural cavity There was pouching of the œsophagus to the right (Fig 3)

Shortly thereafter the boy was taken to Asheville North Carolina.

December 25 1920 drainage had decreased to a very scant amount of thick, mucoid, odorless material

X ray February 5 1921 showed the lung considerably expanded now filling two-thirds of the thorax. There had been practically no discharge for 3 or 4 weeks and the tube was removed (February 8 1921 Fig 4)

March 10 1921 a letter from the attending physician (Dr M C Millender Asheville North Carolina) and the mother stated that the patient was well robust, and could climb thousand foot mountains without fatigue or shortness of breath He had gained 35 pounds since leaving the Hospital 1 year ago The wound remained firmly healed.

CLASSIFICATION OF ŒSOPHAGEAL PERFORATIONS

Perforations of the œsophagus have been reported as due to the following lesions

A Congenital malformations
B Neoplasms
C Aneurisms
D Trauma
  1 Œsophageal instrumentation
  2 Surgical wounds
  3. Stab and gunshot wounds
  4 Foreign bodies
E. Spontaneous rupture
F Inflammation
  1 Acute œsophagitis
  2 Diverticula
  3. Simple or peptic ulcer
  4 Luetic ulcer
  5 Tuberculosis

In some of these processes the perforation starts from within the œsophagus (foreign bodies, ulcer spontaneous rupture carcinoma)

In others (stab wounds abscesses, tuberculous mediastinal glands and aneurisms) a pathological process in the neighborhood of the œsophagus breaks into it

DEVELOPMENT OF ŒSOPHAGEAL FISTULÆ

If the perforation is to the immediate exterior in the cervical region (following stab wounds, œsophagotomy removal of pulsion diverticula) an œsophagocutaneous fistula results

If the perforation is into the aorta or auricle (aneurism) it is immediately fatal

If into the respiratory tract, there will ensue either an œsophagotracheal œsophagobronchial, or œsophagopulmonary fistula.

If directly into the pleural cavity a pyopneumothorax develops. Should this break through the thoracic wall or drainage be established surgically there will be formed a fistula for which we propose the term transpleural œsophageal fistula, i e a communication between the œsophagus and skin via the pleural cavity

A Congenital atresia of the œsophagus There are many cases of atresia of the œsophagus on record (1) The œsophagus and trachea are represented by a single tube until the second month of intra uterine life Occasionally the mid-portion of the gullet fails to develop the pharynx leads down a short distance into a blind pouch then follows a hiatus where no œsophagus can be demonstrated (or it is represented by a fibrous cord) In 60 to 70 per cent of cases, the lower portion of the œsophagus then begins with an opening into the trachea just above the bifurcation Shortly after birth it is noticed that the baby cannot swallow and on attempting to pass a catheter into the stomach, the tube will pass only a short distance down the œsophagus X ray shows the barium mixture outlining the blind upper pouch. The child dies during the first 2 weeks of life of aspiration bronchopneumonia. The tracheal fistula is quite constantly situated at or a short distance above the bifurcation opening into the posterior tracheal wall (very rarely into a bronchus) The upper pouch extends 1 to 5 centimeters below the larynx (Fig 4 schematic—from post mortem specimens of two recent cases at Harper Hospital.)

Where there is no fistula, the conditions found include localized stricture atresia of the lower portion of the œsophagus, complete absence of that organ or double œsophagus

Gastrostomies are ill advised If not immediately fatal, feeding through the gastric fistula will cause some vomiting and regurgitation up the œsophagus into the trachea (in the event that a fistula is present) leading to suffocation or aspiration bronchopneumonia. Richter (2) has attempted closure of the lower œsophagus in two cases by intrathoracic approach

The common embryological origin of trachea and œsophagus may conceivably leave a potential fistula which will cause symptoms only later in life. Thus Zuppinger (3) quotes a case where a 24 year-old man was operated upon (how was not stated) for stenosis of the œsophagus A fistula was found at the level of the sixth cervical vertebra, the size of half a pea, which Zuppinger explained upon the above hypothesis.

B Neoplasms Carcinoma of the œsophagus accounts for the majority of œsophageal perforations. The most frequent site of carcinoma of the œsophagus is the middle third of that organ—opposite the left bronchus Clinically the patient after 2 3 or 6 months increasing difficulty in swallowing, suddenly coughs up some bloody mucus and then notices that swallowing the smallest quantity of liquid produces a very violent coughing fit, with the bringing up of the ingested liquid mixed with frothy mucus. Usually death results from aspiration pneumonia in 2 or 3 weeks.

C Aneurisms Several cases are known where fatal hemorrhage was caused by an aneurism rupturing into the œsophagus. The rupture is usually preceded by ulcera

Brunschwig ( ) states that all the more recent and more exact reports show an œsophageal-tracheal fistula but Hirsch has just reported cases [illegible] there apparently is no such communication—a probe passed up from the stomach into the œsophagus entered and ended in a blind pouch



Fig 3. September 1 1920 Barium escape diminished Lung somewhat expanded

tion, sometimes gangrene, so that carcinoma of the œsophagus may be suspected

Two cases have been reported (4) in which an aneurism caused death in the following manner A small sacculated aneurism at the junction of the transverse and descending aorta, by continued expansile pressure against the posterior wall of the œsophagus where it crosses the left bronchus ulcerated a communication between bronchus and œsophagus Death resulted from aspiration pneumonia without the aneurism itself showing any tendency toward rupture.

A valuable lesson regarding the use of the stomach tube in aneurisms may be drawn from an experience of the late Dr Donald McLean, often related by him After a previous visit, he returned to the home of a patient with a stomach tube to examine him for difficulty in swallowing On arrival he found that the patient had just died from a hæmorrhage through the mouth Autopsy showed an aneurism which had perforated into the œsophagus.

D Trauma Perforation during dilatation for cardiospasm (5) or by the injudicious use of stomach tube or œsophagoscope are on record Surgical wounds stab or gunshot wounds can perforate the œsophagus, forming a fistula between œsophagus and trachea or, as mentioned above a fistula between œsophagus and skin Foreign bodies may ulcerate from the œsophagus into the trachea sometimes within 48 hours (6) Œsophageal fistulæ in the cervical region have become rarer since œsophagotomy for foreign bodies has been supplanted by extraction through the œsophagoscope

E Spontaneous rupture Several cases are on record, where the œsophagus apparently ruptured spontaneously (Cohn 7) Many of these cases have had a pronounced alcoholic history There is bloody vomiting epigastric pain a feeling ' as if something broke inside " and then immediate collapse with dyspnœa and cyanosis There is frequently mediastinal emphysema Death results in a few hours. Postmortem shows a longitudinal rip 2 or 3 centimeters long in the cardiac portion of the œsophagus

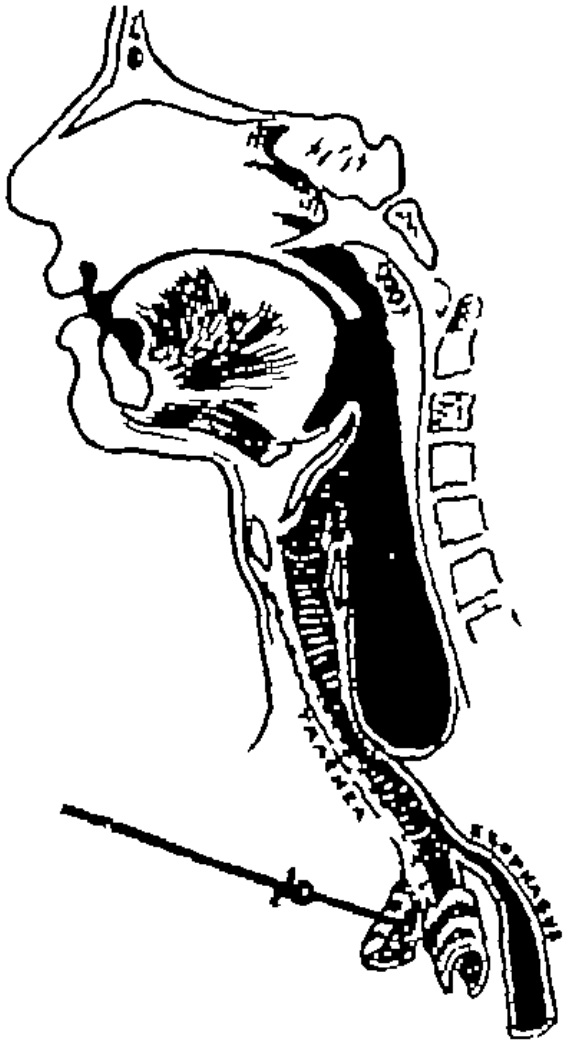


Fig 5 Congenital atresia of œsophagus Upper end of œsophagus ends in a blind pouch Lower end communicates with trachea

F Inflammation (1) *Acute gangrenous stomatitis* may extend down the œsophagus and cause perforation (3)

2 *Traction diverticula* develop following the scar contraction of a lymph node or inflammatory tissue in the region of the tracheal bifurcation They are mentioned in the literature as liable to perforation though because of their minute size, and the fact that they rarely produce symptoms, they are probably not of much significance (Judd & McCrae 9)

3 *Peptic ulcer* Two per cent of gastric ulcers occur in the cardiac portion of the stomach. The same type of ulcer has been observed in the lower end of the œsophagus Kappis (10) collected 15 undoubted cases in 1910 Two-thirds of these had symptoms indicative only of gastric disturbances (pain, vomiting and hæmorrhage) so that it was impossible to diagnose disease of the œsophagus antemortem Severe hæmorrhage was an outstanding feature Four of the 15 cases perforated 2 into the abdominal cavity causing death from peritonitis 1 into the aorta, 1 into the right pleural cavity

Christie (11) reported the following œsophageal peptic ulcer which perforated into the left thoracic cavity with confusing signs of ruptured gastric ulcer

The patient was a male age 60 who had previously enjoyed perfect health At 8.30 p m a short while after drinking a few glasses of beer he was suddenly seized with violent pain and vomiting When seen the next day he had marked tenderness in the epigastrium and an area of dullness at the left base posteriorly He was most comfortable when sitting upright in bed A perforated gastric ulcer was diagnosed, and an exploratory laparotomy performed The abdominal findings were negative He died 3 hours after the operation with extreme dyspnœa Postmortem examination revealed a large left hydrothorax and a perforation of the œsophagus into the left pleural cavity 2 inches above the diaphragm The opening was the size of a quarter It was a simple ulcer with thinned out edges.

One œsophageal perforation was thought to be due to typhoid (12)

4. *Syphilis* Syphilitic ulceration of the œsophagus is extremely uncommon. Udo Wile (13) was able to collect only a few cases in 1914 but he thinks the condition is probably not as rare as the literature would show Œsophageal lues is known only as a tertiary sore a gumma of the submucosa. This may either involute by fatty changes and thereby heal or there may be early ulceration Ulceration generally leads to scar contraction and stenosis. It may however perforate as indicated in the following cases.

Schutze (14) reported a case of a woman, age 42 who had had frequent boils abscesses as a child and had had six miscarriages By being very careful, she could swallow a very small quantity of water without violently coughing Postmortem there was found an ulcer leading into the trachea from the œsophagus, probably luetic.

Basch (15) reported a case in which death took place 4 hours after intravenous salvarsan given for nasopharyngeal gummata The death was found due to a perforated gumma of the œsophagus which had been unsuspected, and which lead into a patch of lung gangrene

Dufour (16) reported a case of "extensive ulceration of the trachea below the ring cartilages, with a perforation in the center No tuberculosis probably luetic. Female, age 38 Wassermann—positive.

Levy (17) reported a case of a woman age 24 who died of an œsophagotracheal fistula No Wassermann was made, but from the microscopic picture (submucus round-cell infiltration and absence of other lesions) he concluded the ulcer was probably luetic. He cites many other reported cases

Beeler's patient (18) was a man age 58 who had had lues 40 years before Following 6 months difficulty in swallowing he suddenly had a hæmorrhage of bright red blood, followed by the usual coughing fit after deglutition. The patient died apparently of bronchopneumonia. Wassermann—positive. No postmortem

5 *Tuberculosis* A thick cluster of tuberculous glands in the neighborhood of the bifurcation of the trachea is very common Their enlargement is almost a daily observation of the postmortem room Zuppinger (3) collected most of the cases of non traumatic œsophageal perforation in children reported up to 1903, and came to the conclusion that all non traumatic œsophageal perforations in children were due directly or indirectly to tuberculosis The retro-œsophageal lymph nodes may enlarge and produce a stenosis of the œsophagus, with or without breaking into it This may be the explanation of a mild difficulty in swallowing in childhood which passes off without any demonstrable cause The first bolus of food goes down with difficulty the remainder more easily Secondary rupture of the glands into the œsophagus takes place only after there has been extensive caseation with abscess formation Often these cases are complicated by caries of the vertebræ

The following types may be recognized

a Perforation from the caseous abscess into the œsophagus The perforation may be first recognized at autopsy or there may be more or less dysphagia pain in the chest, relieved by vomiting of a large amount of material Some of these children (all of the cases have been in children) survive the local condition and die of abdominal disseminated tuberculosis (3, 19, 20)

b Perforation of the abscess into the œsophagus and trachea by far the most common termination There is a certain uniformity in the pathological descriptions an abscess cavity in the mediastinum, communicating with œsophagus and trachea or bronchi

A round smooth opening of the anterior wall of the œsophagus led into an abscess cavity in the mediastinum the size of a hen's egg behind the end of the trachea and the two bronchi There was an aperture in the right bronchus one inch from the bifurcation leading into this cavity (21)

Tuberculous enlarged bronchial gland necrotic with an opening between the œsophagus and trachea *the size of a finger* (11)

There were many adhesions in the mid wall of the left lung near the aorta There was a walnut sized cavity into the upper part of which two openings lead into the œsophagus. There was much tuberculosis in the left lung (22)

Œsophagus communicated with a cavity the size of a walnut formed from a caseous gland This cavity communicated with the right bronchus through a two-centimeter opening (23)

Several of these cases have also shown advanced pulmonary tuberculosis The lung gangrene may have been thought to follow aspiration of food through the œsophageal perforation (24), or the abscess may have been primary, the perforation of the œsophagus occurring after a few days of foul putrid expectoration The pathological sequence then was advanced phthisis, gangrene with abscess formation at the hilus, perforation into the œsophagus In Tirard's case (25), repeated chest aspirations were made searching for the abscess before the œsophagus perforated

Most of the cases of this group have been between 5 and 20 years of age, but there has been an occasional case in advanced age

Selenkow (26) reported a case of a man aged fifty who died of œsophageal fistula following 3 or 4 months difficulty in swallowing This was thought to have been caused by a carcinoma of the œsophagus with perforation into the trachea. At autopsy there was a well marked right upper lobe tuberculosis, and an egg-sized cavity in the mediastinum into which the œsophagus opened

Incidentally the contrary mistake is also recorded A man was treated in various hospitals and sana

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PSEUDOHERMAPHRODITISMUS MASCULINUS INTERNUS

Congenital Malformation in Scrotum—Two Testes and Uterus in Right Portion of Scrotum[1]

By DAVID W MacKENZIE, M.D F.A.C.S Montreal
From Department of Urology Royal Victoria Hospital, Montreal

MALE, age 38 single, admitted May 27, 1918 occupation factory hand Patient complains of rupture, pain and mass in right groin. He thinks he has had a mass as long as he can remember but that it has been more pronounced for the past 23 years during the last 4 days, it has increased in size and has become painful

Diagnosis Congenital mal-descent of testis with uterus in the right portion of the scrotum

History Since the age of 5 or 6 years he has had a swelling in the right groin he thinks this followed [illegible] and

use of a truss, which he has worn most of the time as long as he can remember

Last week he had a vomiting attack accompanied by headache. A few days later, 4 days ago the swelling in the groin increased and extended to the scrotum There was considerable pain which has persisted He has had no vomiting for 4 days.

Past history Patient had scarlet fever in childhood. Several times he has had headache and vomiting which lasted one or two days. He does not smoke or drink. Two years ago he had a gonorrhoeal urethritis of which he has never been completely cured. There is no history of lues

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The left axilla has a palpable gland otherwise normal. The chest is well formed the expansion is good and equal, the vocal fremitus is normal percussion is normal, lung is resonant throughout auscultation is normal. The pulse rate is 70 regular and of good volume and tension the vessel wall is just palpable the heart has a normal beat, it has no murmurs. The upper teeth are false, the lower poorly kept. The tongue is clean the abdomen moves freely on respiration it is equal and symmetrical Deep and superficial reflexes are present there are no pathological reflexes. There is no costolumbar tenderness there is no pain or tenderness along he ureter or over bladder The

well up into the inguinal canal, where there is a marked impulse on coughing this scrotal mass does not transmit light. The left scrotum is small and no testis is present. No perineal dimpling The prostate is normal in size, contour and consistency in the region of the right seminal vesicle there is an elongated mass which extends up as far as the finger can reach the left seminal vesicle is small and firm The urine is clear dark amber acid 1019 no albumin or sugar Microscopic examination shows no pus, but many urates. The Wassermann is negative.

The cord was found large hard and continuous to scrotum the hernial sac identified freed ligated at neck and resected

The mass consisted of two moderately sized testes in right scrotum with a large mass between which extends up the canal and down the course of the vas (Fig 1) One testis was freed, placed in warm gauze with its pampiniform plexus and vas intact The other testis with oblong mass attached was freed well into pelvis, ligated here severed with cautery and removed *en masse* The first testis was replaced in scrotum and wound closed by Bassini method

Convalescence uneventful. May 25, 1920, active spermatozoa were found in seminal fluid

REPORT ON SPECIMEN

Mass from right side of scrotum The specimen received removed from the right scrotal sac consists of a well formed testicle of normal size and apparently intact tubules. Quite closely attached to it is an elongated, pear shaped organ measuring 9 5 by 4 centimeters with a central canal which on being opened presents a well-formed mucous membrane, supported by a thick muscular wall. This organ-like structure (uterus) lies below the testicle in the scrotum, the larger end being dependent. It conforms in general with the appearance of a juvenile uterus, being narrow and possessing a long cervical end. To the left lower aspect a well formed fallopian tube 6 centimeters in length is attached. This tube shows a rudimentary fimbriated extremity and a small pedunculated cyst, which apparently corresponds to a cyst of Morgagni. A well-marked epididymis can be made out on the posterior surface of the testicle and from this a tortuous tube (vas) runs up on the posterior surface of uterus and toward its upper extremity becomes embedded in its posterior wall but the cross section shows a well marked lumen. Surrounding this cord and embedded in the con-

Read at Urological Society New York Academy of Medicine, April 27 1921.

nective tissue are a number of smaller cord like structures, some of which have a very definite

normal uterine mucosa Embedded in this are a number of tubular glands, which, although rather irregularly arranged, tortuous and small are lined by a single layer of high columnar epithelium The mucosa is supported by a rather vascular, but quite typical muscularis Diagnosis abbreviated and juvenile uterus

Sections from the fallopian tube show a well-formed and definite structure consisting of folds and projections of mucosa, which are lined by a simple columnar epithelium and which surround a lumen. This mucosa is supported by a muscular layer and covered by a serosa, which shows marked oedema. Quite closely attached to the tube and included in the same section are numerous cross sections of tubules, which resemble very closely those of an epididymis Diagnosis fallopian tube and tissue from epididymis

Section from the testicle consisted of testicular tubules which are evidently actively functionating, as many spermatozoa can be demonstrated.

Sections from the cord-like structure in the posterior aspect of the uterus show a very thick walled muscular tube with a small lumen in which lie a number of papillary projections lined by stratified columnar epithelium Diagnosis vas deferens.

Another section taken from somewhat similar structure lying along the lower wall of uterus shows a similar but much smaller vas deferens

Sections from the rather soft elongated mass which lay near the fallopian tube and which was thought possibly to be ovarian tissue, show the mass to be made up of cross sections of tubules resembling those of epididymis therefore, probably epididymis

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tube, led

me to look up the literature, where I found 26 very similar cases with several more of the same

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reported by Braithwaite Craig and Brindeau. In one-quarter of the cases the uterus was double when single it was usually atrophied The testicles were normal in only a very few cases they were generally atrophied and degenerated. The uterus continued into a vagina opening into the urethra, a fact which explains the escape of blood from the canal as has been noted after the operation

EMBRYOLOGICAL GENESIS

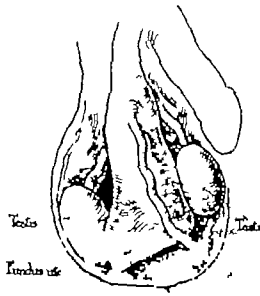
Hermaphroditism is divided into two groups

1 Hermaphroditismus verus in which an individual is truly bisexual and in possession of independent testicles and ovaries, or at least, one ovary and one testicle. Recent investigations have made the existence of hermaphroditismus verus doubtful, as in the cases so far reported the histological evidence has been lacking or has been incomplete. A few cases of fused, so-called ovotestis, have been reported.

1 Pseudohermaphroditismus This is divided into pseudohermophroditismus masculinus and pseudohermaphroditismus femininus, in which a predominant typical and complete sexual organization of one type is associated with an incomplete or complete set of sexual organs of the opposite sex, but without sex gland (ovary or testicle) It may therefore be subdivided into (1) pseudohermaphroditismus internus in which the internal organs of the opposite sex exist. (2) pseudohermaphroditismus externus in which the external organs of the opposite sex exist, and (3) pseudohermaphroditismus completus in which both are present. Pseudohermaphroditismus masculinus is the most frequent. Up to 1908 Neugebauer collected altogether 910 cases of pseudohermaphroditism and in these 722 were of the masculine variety and only 188 of the feminine variety while 613 of the whole series were examples of pseudohermaphroditismus masculinus externus (see Birnbaum A clinical manual of malformations, etc. translated by Blacker MacMillan Co. 1912) It can again be subdivided into pseudohermaphroditismus masculinus internus and externus. In the internus are present besides well-developed, typical, external and internal male genitals, vagina, uterus and tubes which usually terminate in the situation of the colliculus seminalis. The case recorded above belongs to this category

In the pseudohermaphroditismus externus the external parts of the female type are present.

All cases of hermaphroditism are intelligible on the basis of the embryological sexual development For in the early fœtal life, during the period of mesonephric development, the human organism is bisexual or possesses, at least, all the



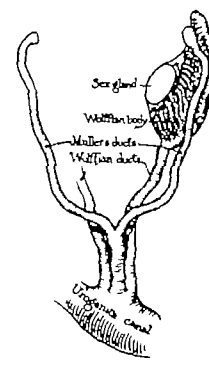


Fig. 1 (at left) Schematic view of condition as found at operation.
Fig. 2 Schematic view of embryogenesis of muellerian and wolffian ducts.

tructures necessary for the development of both sexes. At this time there develops a ridge along the border of either mesonephros This gives rise to Mueller's duct, a cord like structure which later forms a tube On either side, this lies internal to the wolffian duct (primitive ureter) and terminates with the wolffian duct into the urogenital sinus As the sexes differentiate the fate of these structures is dictated by (1) the development of the sex gland (ovary or testis) which develops from the genital tubercle of the mesonephros. The latter then disintegrates, leaving only a small part which in the male goes to form epididymis, seminal vesicles, coni vasculosi, vasa efferentia and ejaculatory duct while in the female it forms the paroophoron the duct of Gartner and the parovarium (2) The fate of Mueller's ducts. As the male development proceeds, these involute as early as the seventh to the eighth week. Only rudiments remain as the utriculus masculinus (prostatic sinus) and hydatid of the epididymis. In the female, however Mueller's ducts continue to develop and to reach the height of development in fusion, anteriorly to form the tubes, posteriorly, to form uterus and vagina. Pseudohermaphroditismus masculinus means, therefore, embryologically considered persistence and more or less complete or as in this case partial, rudimentary or infantile development of the muellerian ducts to uterus, tubes and vagina which terminate in the normal prostatic sinus The cause of this lack

determination of sex characters (hormone action) In favor of this is the occasional co-existence of other physical and mental female characters. These secondary characters were lacking in this case The individual was apparently a full male But here also the female organs were under developed infantile in type, as in Webster's case.

Interesting is the peculiar rotation that occured in the hernial descent to the scrotum so that the fundus which originally points upward in the abdomen occupies the lower position in the scrotum

The literature on pseudohermaphroditism has been reviewed by Neugebauer (1) Since then the following cases have been reported of which Webster's case is nearest to the one described above.

Clark tells of patient of normal male appearance 30 years old. He had been married 6 years but he had no children An operation for hernia on the left side drew from the abdomen a normal testis uterus, and tubes There was no testis in the scrotum

Brindeau's patient was a soldier 35 years old He was married and was the father of two children An operation for a right scrotal hernia revealed a mass containing a normal uterus with right tube

and also a testicle with vas The left horn of the uterus had another tube within the abdomen and when drawn upon it brought down a second testicle

generation of a female with the exception that the positions usually occupied by the ovaries were filled with atrophied testes.

Pellegrini reports a case in which a uterus with

both a uterus with tube and a testis, arranged from below upward as right testicle, uterus and tube, *left testicle*

Viscontini reports having found on a well-developed man 22 years old during an operation for hernia, a mass containing a uterus with left tube The scrotum contained two normal testicles, on the right and the left sides

Duse reports an operation for a right-sided hernia on a man 20 years of age Both testes were situated in the right side of the scrotal sac In following the vasa to the abdominal cavity a unicornate uterus of infantile type was found.

Webster reports on a specimen sent to him while he was surgeon in our own hospital. This specimen is almost identical with our own case above

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SARCOMA OF THE PROSTATE[1]

By WILLIAM WARREN TOWNSEND M D F A C S, Burlington Vermont

WE report the following case with a digest of the literature on sarcoma of the prostate in the adult first, because of the comparatively few reports to be found in the literature, and second that in so far as we have been able to ascertain there has been no case reported in a man of the advanced age of our patient

W H C., age 71 was referred October 31 1919 His chief complaints were that of dysuria and frequency accompanied by symptoms of urinary obstruction He had been losing flesh for about 6 months and had periodic attacks of gastro-intestinal disturbance Reference of Mr C to the gastro-enterologist and the neurologist failed to lead to the discovery of any gastro-intestinal or nervous pathology that could be ascribed as the cause of the emaciation or the gastro-intestinal symptoms. Blood examination and Wassermann test were negative Urological examination showed by rectal palpation an enlarged and soft prostate The urethral length was increased to 25 centimeters. No obstruction was met in passing a No 20 French soft rubber catheter There was 120 cubic centimeters residuum and the bladder capacity was 200 cubic centimeters. Cystoscopic examination showed a large uniform intravesical prostatic outgrowth a generalized cystitis and trabeculation The ureter openings were not seen and as the examination was painful no prolonged attempt was made to find them Personal circumstances prevented an immediate hospital admission for prostatectomy, so palliative treatment was instituted until he entered the hospital on January 23, 1920 Within 24 hours after admission to the hospital Mr C. developed a pneumonia which further delayed operation On February 14 an attempt at suprapubic prostatectomy was made Upon introducing the finger into the urethra to start enucleation it was obvious that something different from the ordinary was being encountered as there was no line of cleavage and the substance of the growth was so friable that it had to be removed as best we could with a gall bladder scoop and flushing Enough pieces were gathered to send to the laboratory and the following report from the pathologist is presented

"Report of examination of several small fragments of whitish friable tissue case of Mr C the largest about 4 millimeters in diameter The larger fragments were composed of closely packed small round mononuclear cells with an occasional cell of large size with more cytoplasm with very small amount of connective tissue scattered through the growth in small fibers and short trabecular like masses showing no definite arrangement Some of these masses were partly surrounded with loosely formed connective-tissue walls infiltrated with the round cells Poorly outlined blood vessels appeared in the growth and a few atrophied gland tubules were visible in some of the fragments. The specimens presented the characteristic structure of round cell sarcoma.

Mr C s convalescence from operation was uneventful His suprapubic wound closed and normal urination became established in 3 weeks. He was

the case and report the ultimate result at some future date

A sarcoma of the prostate may start primarily or may transplant itself from the testicle or elsewhere The small round-celled form appears to be the most frequent H A Royster's (1) statement that they often result from injury has been challenged by Schepelmann (2) who lays down the dictum that "there is no possibility of a neoplasm having been caused by injury, if the interval between the accident and the development of the tumor is more than 3 or 4 weeks"

One of the earlier seemingly well authenticated cases has been recorded by Coupland (3) a man, aged 29 with a "lymphosarcoma" However, J Ewing (4) doubts the diagnosis of lymphosarcoma, as the structure of the gland does not favor the growth of such tumors

Wharton (5) has put on record the case of a man, aged 55, with retention of urine. The patient died on the ninth day after operation Postmortem revealed a round celled sarcoma of the prostate.

A case quite similar to that of Wharton has been reported as early as 1873 by Socin (6) regarding a man, aged 51, who died of septicemia 5 weeks after catheterization

West (7) reports the case of a man aged 21, with difficult micturition The disease took a rapid course Autopsy showed a large tumor composed of small round spindle cells

[1] Read at the meeting of the American Association of Genito-Urinary Surgeons, Rochester Minnesota, June, 1920

H Hill (8) has seen the specimen from a man aged 64 who had died suddenly after suppression of urine for 10 days. The growth consisted of an abundant stroma of fibrous tissue containing many spindle cells

C L Gibson (9) reported the case of a man aged 35 who 4 months previously had been operated on the portion removed was a small, round cell sarcoma of the prostate. However the tumor grew rapidly and 4 months after the first operation rectal examination showed a mass the size of a fist occupying the prostatic region Combined suprapubic and perineal operation was followed by death from exhaustion

A second case reported by Gibson (10) was that of a man, aged 36 admitted for urinary trouble. An irregular mass replaced the prostate The tumor grew very rapidly The patient died of exhaustion Microscopic examination showed a round cell sarcoma moderately vascular Gibson reported the above cases to this society in 1904 and 1909

Charles E Powers (11) in 1908 was consulted by a man aged 60 for rapidly increasing difficulty in urination Rectal examination revealed a very large rounded slightly nodular prostate He succumbed on the fifth day after operation. Examination of the masses removed showed a small round celled sarcoma of the prostate. In reviewing the literature, Powers considers this form as the most frequent and the condition occurring most frequently in childhood

Analyzing the cases tabulated by Powers (9) and Proust (12) and eliminating those in the latter's tabulation not accepted as authentic up to the year 1907 we have 33 cases To these must be added a case report by Cabot (13) regarding a man aged 75 with a small spindle cell sarcoma and a case described by Bobbeo (14) Moreover, Depage (15) successfully removed a prostate from a man aged 25 Microscopic examination showed a small round cell sarcoma.

In 1909 J R Eastman (16) reported the case of a man, aged 27 with a spindle-celled sarcoma of the prostate apparently running a course covering 5 years Eastman believes that sarcoma of the prostate is less rare than had been imagined owing to the circumstance that until recently very little distinction had been made between carcinoma and sarcoma. Pouchet (17) reiterates the fact that sarcoma in adults is rare.

Newman (18) reports the case of a man aged 35 with retention of urine following an injury The entire prostate was found occupied by a growth which proved to be a round-celled sarcoma. One of the important features in this case was the primary existence of a small, well-encapsulated sarcoma of the prostate which had given no symptoms before the injury to the perineum when the rupture permitted the rapid growth of the neoplasm.

The common symptoms besides the presence of the tumor are dysuria retention, hypogastric and perineal pain The treatment is symptomatic and palliative. J F Warbasse (19) urges enucleation. Others recommend radium treatment at the earliest moment Pfahler (20) claims X rays will cure the majority of cases Deaver (21) calls attention to the rapid growth of sarcomata.

The *New York Medical Journal* (22) editorially dwelling on the malignancy of prostatic sarcoma, points out that as the neoplasm grows in the adult less rapidly than in children operation offers more chance of success in the adult. Early diagnosis is important in elderly subjects disturbances of micturition and the appearance of a tumor in the hypogastrium and perineum leading to the phenomena of cachexia should cause suspicion.

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UTEROPLACENTAL APOPLEXY (HÆMORRHAGIC INFARCTION OF THE UTERUS) IN ACCIDENTAL HÆMORRHAGE

REPORT OF A CASE AND STUDY OF THE CLINICAL AND PATHOLOGICAL DATA OF SIXTY EIGHT CASES IN THE LITERATURE[1]

BY PRENTISS WILLSON M.D. WASHINGTON

HISTORY

SINCE Rigby established the differentiation between antepartum hæmorrhage due to placenta prævia and that due to premature separation of the normally implanted placenta the etiology of the latter condition continued practically unknown. *Traumatism* from without or from within through traction on an absolutely or relatively shortened cord, sudden reduction in the size of the uterus from the birth of a twin or the emptying of the membranes of an excessive amount of amniotic fluid inflammatory changes in the decidua even violent emotion were all, from time to time, advanced as etiological factors of significance. Later the association of albuminuria with a large percentage of these cases attracted attention and the idea was advanced that the placental separation was determined by hæmorrhagic lesions in the decidua which were associated with the presence of a nephritis, usually chronic in character. As early as 1903 Muus of Copenhagen advanced the hypothesis that accidental hæmorrhage was a manifestation of a pregnancy toxæmia, and called attention to the frequent association of eclampsia with these cases.

To Couvelaire, however, undoubtedly belongs the distinction of having made the first really important contribution to this subject since that of Rigby, a contribution which has not only served to focus attention on accidental hæmorrhage and to blaze an approach to its study from an entirely new angle, but promises, possibly, to aid materially in the investigation of the whole broad subject of toxæmia in pregnancy. In 1911 in one case and again in 1912 in two cases he described in great detail the gross and histological findings in the uterine wall in accidental hæmorrhage. These consisted, in brief, of an extensive subserous ecchymosis and of a marked hæmorrhagic infiltration of the myometrium, tearing the muscle bundles apart and even disassociating them fiber from fiber. These lesions he believed to be toxic in character. It is true that prior to Couvelaire's first paper there were in the literature a few reports of similar changes in the uterine wall in cases of accidental hæmorrhage but none of the authors seems to have been much impressed with the importance of his observation. Couvelaire's work immediately attracted attention in France and in Europe generally, and in 1913 Essen Moeller contributed an important paper in which he reported five cases of this type. In concluding this paper he said:

> [illegible] of [illegible] by [illegible] of the same kind which causes albuminuria eclampsism, or eclampsia. The extensive bleedings in the uterus (*apoplexie utéro placentaire*) observed by Couvelaire and other authors are probably characteristic of the eclamptic form of accidental hæmorrhage.'

In America these advances in our knowledge seem to have attracted no attention until Williams, in 1915, reported the findings in the uterine wall in two of his cases and reviewed the literature. The pathological picture noted by him was essentially the same as that described by Couvelaire and he also, concluded that the lesions present were toxic in origin. Since this date case reports and articles on this subject have been accumulating with increasing rapidity. Thus Williams, in 1915, collected about 20 cases, Ahlström in 1919, 43 cases, and Willson, in 1921, 60 cases.

NOMENCLATURE

Kolisko, 1903, designated this condition hæmorrhagic infarction of the uterus (*infarctus hæmorrhagicus uteri*). Couvelaire,

[1] Read before the Medical Society of the District of Columbia April 27 1921

1911, suggested the term uteroplacental apoplexy (*apoplexie utéro-placentaire*) Williams 1915 stated that neither of these terms seemed to describe the condition accurately but that he was not prepared to suggest a better one FitzGibbon 1918 proposed the term antepartum toxemic hæmorrhage

SCOPE OF PAPER

In this paper in addition to reporting a case of my own, I wish to present an intensive study of the clinical and pathological data of all the cases in the literature to this date It is hoped that the examination of these data here brought together for the first time, will serve to give a composite picture of the condition sufficiently accurate and authoritative to justify drawing more or less definite conclusions regarding its etiology and pathogenesis its relation to accidental hæmorrhage and the other toxemias of pregnancy and its diagnosis, prognosis and treatment In Table I the clinical data of 69 cases are assembled. The cases are arranged and numbered in the order of their publication In Table II the pathological data of 46 cases observed at laparotomy or autopsy are assembled The case numbers in this table correspond to those in Table I the omitted cases being those in which there are no other pathological data reported except the presence of subserous ecchymosis and hæmorrhagic infiltration of the uterine wall.

REPORT OF A CASE

My own case is as follows

N D age 37, illegitimately pregnant for the first time, was admitted to the Riggs Building of the

examination on the 19th, it was found that her family and previous history were negative She had menstruated first at 14 years of age. The last period had begun on February 15 1915 The date of impregnation and quickening were unknown At this time the fundus was three fingers breadths above the umbilicus The presentation was trans-

bitrochanteric, 31 centimeters, and the external conjugate, 19 centimeters The limbs were œdematous and the urine contained albumin. The blood pressure was not taken. Under appropriate treatment the œdema cleared up, the albumin dis-

1915

Labor began at 9 30 on the evening of November 8 at the estimated thirty-eighth week of pregnancy The pains were severe and every 4 or 5 minutes from the first After lasting for about 2 hours there began to be some bleeding from the vagina and the patient was nauseated and vomited at frequent intervals. She complained of great pain and tenderness in the abdomen and of feeling very bad. These symptoms continuing she was sent to the hospital. Upon admission to the hospital the pulse was 106 temperature 97 respiration 22 The patient looked very ill The expression was anxious, marked pallor with a bluish tinge to the lips, cold, clammy perspiration—in a word the typical picture of serious shock and hæmorrhage There was fairly free bleeding from the vagina. The abdomen was very tender the uterus was of a ligneous consistency and did not relax. Palpation of the fœtus was almost impossible, but the head was made out at the pelvic brim. The fœtal heart could not be heard. Vaginal examination disclosed the cervix dilated to admit one finger and not taken up. No placental tissue could be felt.

Diagnosis Premature separation of a normally situated placenta with combined external and concealed bleeding. Fœtus dead.

given by rectum and retained. Operation under ether anæsthesia Iodine preparation Ergotole and pituitrin were given hypodermically at the beginning of the operation. The abdomen was opened by an incision in the median line above and below the umbilicus There was a considerable quantity of blood-stained serum in the peritoneal cavity The uterus presented such a peculiar appearance that it was delivered from the abdomen to permit of closer inspection. The whole organ had a mottled, ecchymotic look, the colors ranging from that of the normal organ through blue to almost black. The discoloration was greater in the region of the left cornua.

and ovaries were apparently normal Upon incision of the uterus the placenta was found attached to the left side of the anterior uterine wall and separated for about one-third of its surface The uterus con-

tained over a quart of fluid and clotted blood The female fœtus was dead and was removed in the intact membranes. The cord was wrapped twice around the neck and the amniotic fluid was stained with meconium but not with blood There was some question as to the proper course to pursue in regard to leaving or removing the uterus its appearance was most abnormal and at first it failed to contract well After massage and the application of hot towels the contraction was more satisfactory and it was finally closed by interrupted sutures, a gauze pack having been first introduced with one end carried down into the vagina. One thousand cubic centimeters of salt solution were given by hypoder moclysis during the operation

The patient returned to the ward with a pulse of 136 and reacted quickly Her condition remained thoroughly unsatisfactory however and despite all the usual treatment she died about 3 hours after the operation.

Autopsy by Dr Lester Neuman Section made 12 hours postmortem Body of a female over 30 years of age Rigor mortis fairly well marked in all extremities. Inspection shows enlarged breasts with pigmented areolæ a recent median abdominal incision and the two points of entry for hypoder moclysis. The heart lungs and thoracic aorta are apparently normal The abdominal cavity contains about 500 cubic centimeters of bloody fluid The liver is pale and reduced in consistency The gall bladder is apparently normal. The spleen is reduced in consistency The stomach and intestines, aside from being pale, are apparently normal. The kidneys are pale and reduced in consistency The urinary bladder is distended with urine.

The fallopian tubes and ovaries are apparently normal. The uterus is very much enlarged and shows a recent median incision on the anterior

edly was an important contributory factor in the clinical diagnosis of shock.

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musculature appears normal with the exception of marked hæmorrhagic extravasations between the bundles of muscle fibers. The placenta is apparently normal with the exception of a slightly bi aline appearance of the stroma of the villi

SUMMARY OF THE CLINICAL DATA IN TABLE I

Age This was mentioned in 59 cases. The youngest patient was 17 the oldest 42 and the average age was 32 2 years.

Parity This was given in 67 cases Of these 18 were I paræ 1, II para 6 III paræ 5, IV paræ 5 V paræ 5 VI paræ 4, VII-paræ 5, VIII paræ 5 IX-paræ 2 X paræ 1 XI para 5 XIII-paræ 1 XIV para and 4 were stated to be multiparæ Of the 67 cases, therefore 26 8 per cent were primiparæ 73 1 per cent multiparæ and the average parity was 5 3

Period of gestation This was mentioned, more or less definitely in 58 cases. Some authors refer to calendar and some to lunar months. As near as could be determined however the condition developed at the following periods, in the number of cases indicated In the seventh month 5 cases in the eighth month 10 cases in the ninth month 21 cases, and in the tenth month and at term 22 cases.

Symptoms of toxæmia The condition of the urine was mentioned in 51 cases. It was stated to have been normal in 7 cases Albumin was present in quantities varying from a trace to an amount sufficient to justify the terms loaded and solid in 44 cases. It was therefore present in 86 2 per cent of the cases. Casts were noted in 12 cases always in association with albumin Blood was mentioned in several cases but it was not always possible to determine whether catheterized specimens were referred to

It is surprising to note that although the majority of the cases are only recently reported the blood pressure was mentioned in only 9 cases The maximum systolic pressure readings in these cases were 100, 120 160 170 174 180 200 260 and 280 the average being 182

Various other clinical manifestations of toxæmia were noted Jaundice was noted in 1 case œdema in 12 cases headache in 7 cases vomiting throughout pregnancy in 1 case and visual disturbances in 6 cases, 1 case having albuminuric retinitis, and 2 patients being blind Eclampsia was present in 6 cases.

In 55 cases in which something definite is said regarding the presence or absence of clinical evidence of toxæmia the condition of the patient indicates its absence in 7 cases and its presence in 48 cases in other words, toxæmia is indicated clinically in 87 2 per cent of the cases. If here are added 2 cases in which distinct hepatic or renal lesions of a toxic nature were noted at autopsy although clinical evidence of toxæmia is not mentioned the figures become 7 cases without evidence of toxæmia, and 50 with such evidence, or 87 7 per cent of 57 cases

and concealed hæmorrhage because in the majority of instances there is at least an escape of blood stained serum from the vagina. However in 67 cases in which this point could be more or less

1911 suggested the term uteroplacental apoplexy (*apoplexie utéro-placentaire*) Williams, 1915 stated that neither of these terms seemed to describe the condition accurately but that he was not prepared to suggest a better one. FitzGibbon 1918 proposed the term antepartum toxemic hemorrhage.

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impregnation and quickening were unknown At this time the fundus was three fingers breadths above the umbilicus The presentation was transatous and the urine contained albumin. The blood pressure was not taken. Under appropriate treatment the oedema cleared up the albumin disappeared from the urine and none was found at the examinations made during the last 3 weeks before labor Full term was estimated for November 22 1915

She complained of great pain and tenderness in the abdomen and of feeling very bad. These symptoms continuing she was sent to the hospital. Upon admission to the hospital the pulse was 106 temperature 97 respiration 22 The patient looked very ill The expression was anxious, marked pallor with a bluish tinge to the lips, cold, clammy perspiration—in a word the typical picture of serious shock and hemorrhage. There was fairly free bleeding from the vagina. The abdomen was very tender the uterus was of a ligneous consistency and did not relax Palpation of the fœtus was almost impossible, but the head was made out at the pelvic brim. The fœtal heart could not be heard. Vaginal examination disclosed the cervix dilated to admit one finger and not taken up No placental tissue could be felt.

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for about one third of its surface The uterus con-

52	Morse	VIII.	40	8	Heavy trace of albumin and casts	160		Died	Died	Combined	Partial	Porro	Nephritic toxemia in preceding pregnancy. Death due to pneumonia
53	Gross	X	33	7	Albumin present		None	Recovered	Died	Combined		Porro	Accidental hemorrhage in ninth pregnancy
54	Smyly	III	30		Loaded with albumin and hyaline and granular casts			Recovered	Died	Concealed	Complete	Cesarean section	
55	Smyly	IX	39	9	Albumin, blood and casts	260	Headache and impaired vision	Recovered	Died	Concealed	Complete	Cesarean section	Patient tonic for 4 weeks before attack. Ecchymosis on left buttock
56	Ahlström	V	29	6	Albumin present		Œdema of face and legs for 3 months	Died	Died	Combined		Vaginal hysterectomy	Postpartum hemorrhage caused death
57	Ahlström	VIII	29	9				Died	Died	Combined		Version and extraction	Postpartum hemorrhage caused death
58	Ahlström	III.	33	9	Normal			Died	Died	Concealed	Complete	Bossi dilator and craniotomy	Postpartum hemorrhage caused death
59	Vogt	IV	34	7			Eclampsia	Died	Died	Concealed	Partial	Cesarean section	
60	Quigley	VI.	33		Albumin present	174	Headache, œdema and visual disturbance	Recovered	Died	Combined		Cesarean section	Toxemia, short cord, and fall
61	Larsen	VII.	35	9	No albumin			Died	Died	Combined	Complete	Version and extraction	Death due to postpartum hemorrhage
62	Harrison	I	26	8	Distinct trace of albumin		Œdema of legs	Recovered	Died	Combined	Complete	Cesarean section	
63	Ley	IX.	41	9	Thick cloud of albumin and granular casts		None. Well until day of attack	Died	Died	Combined	Complete	Manual dilatation of cervix, rupture of membranes, vaginal plug, 1 suppositories, finally delivered with forceps	Hysterectomy for rupture of the uterus
64	Ley	XIII	40	8	Albumin, hyaline and granular casts		None. Well until day of attack	Died	Died	Combined	Complete	Porro	
65	Ley	VII.	37	9	Much albumin, hyaline and granular casts		Frontal headache preceded attack for 24 hours	Died	Died	Concealed	Complete	Porro	
66	Ley	VI.	32	9	Albumin present		Œdema of legs and fainting attacks for 2 days	Recovered	Died	Concealed	Complete	Cesarean section	Uterus relaxed 1 first but finally contracted well. Watch remains negative
67	Fordyce and Johnstone	I.		9	Large amount of albumin. Suppression		Eclampsia. Œdema of trunk and limbs	Died	Died	Combined	Partial	Porro	
68	Snowden	III.	37	7	Albumin and hyaline and granular casts	180	Œdema of face and feet, headache, anuresis	Recovered	Died	Concealed	Complete	Cesarean section	Bleeding for several days from the abdominal incision
69	Willson	I.	37	9	Albumin had been present previously but not at time of attack			Died	Died	Combined	Partial	Cesarean section	

accurately determined, I have classified 46 cases in the frank or combined type, 68 6 per cent of the cases, therefore having frank bleeding

Degree of placental separation In 48 cases in which this point could be determined the separation was complete in 36 cases, and partial in 12 cases.

Method of delivery The Porro operation was performed 21 times, conservative cesarean section 21 times abdominal hysterectomy without opening the uterus 4 times vaginal hysterotomy 2 times abdominal hysterectomy for rupture of the uterus once excision of the pregnant horn of a uterus didelphys once extraction of the fœtus 12 times (forceps, craniotomy version and extraction) spontaneous delivery occurred in 4 cases abdominal

per cent There were 62 fœtal deaths in 67 cases, a mortality rate of 92 5 per cent. This series of cases, however includes only cases of accidental hemor

eliminate all cases in which the diagnosis was established postmortem Doing this we find 19 maternal deaths in 50 cases in which the diagnosis was established during life by means of a laparotomy a mortality of 38 per cent. The five children which survived were all delivered by cesarean section, there being no case in which the fœtus survived delivery through the vagina.

The maternal mortality rates for the various methods of delivery were as follows For the Porro operation, 10 deaths in 21 cases, a rate of 47 6 per cent for conservative cesarean section, 4 deaths in 21 cases, a rate of 19 per cent for hysterectomy without opening the uterus, 2 deaths in 4 cases, a rate of 50 per cent the case of hysterectomy for uterine rupture resulted fatally as did the 3 cases of hysterectomy for postpartum hemorrhage.

Miscellaneous observations The Wassermann reaction in 2 cases in which it was mentioned was negative. One patient was syphilitic Ecchymoses in the skin were present in 2 cases a large ecchymosis on the left buttock in 1 case, and an ecchymotic

ectomy was necessary to control postpartum hemorrhage. Death was attributed to an acute exacerbation of a chronic colitis, however Post

performed.

SUMMARY OF PATHOLOGICAL DATA IN TABLE II

Macroscopical appearance of the uterus At autopsy or laparotomy the uterus presents a very striking picture its appearance being compared by many to that of an ovarian cyst with a twisted pedicle The whole organ may be almost black or mottled throughout from the presence of the effused blood in its walls or under the peritoneum or one lateral half or the anterior or posterior surface may appear normal and the opposite portion show the characteristic discoloration.

The myometrium As might be expected the extent of the hemorrhagic infiltration of the uterine musculature varies greatly Subperitoneal ecchymosis due to extravasation of blood under the peritoneum seems to be present in all cases, and in a few is the only lesion noted Between such cases as these and those in which the whole uterine wall is literally inundated with blood all stages in the process are encountered The hemorrhage constantly tends toward separating and tearing apart the muscle bundles, but it is only in the areas where it is most intense that the individual fibers are separated from each other This rarely occurs In such localities the muscle bundles may be seen occasionally as strands of tissue traversing great lakes of effused blood Œdema is very frequently noted, and areas free from hemorrhage often show much cedematous infiltration Increase in the amount of connective tissue is noted occasionally Round-celled infiltration around some of the hemorrhagic foci has been noted and also the presence of leucocytes containing blood pigment. Such areas probably indicate that successive effusions of blood occur some older and some more recent

The distribution of the hemorrhage in the uterine wall is interesting and from an etiological point of view most suggestive The process is always worse in the region of the fundus and upper part of the body and the lower uterine segment seems to be frequently entirely spared. In the great majority of the cases the area of the uterine wall over the site of the placenta is the most involved and the extravasation is usually worse on the anterior posterior or lateral aspect of the uterus depending upon the location of the placenta. Another striking finding is the tendency of the hemorrhagic process to reach its acme under the peritoneum. There are a few exceptions to this, but the great majority of the observers note particularly and specifically that it is the outermost layers of the myometrium which show the densest and deepest discoloration from the bloody effusion. In this connection it

third of the thickness of the uterine wall is literally torn asunder by a massive and brutal hemorrhage

This is illustrated most strikingly in the colored plate of Fordyce and Johnstone, showing a cross section of the uterus through the placental site at a level just below the tubal insertions

The observations regarding the condition of the muscle fibers themselves are rather contradictory In 14 cases in which this point is mentioned they are stated to have been normal or healthy in 7 cases and abnormal in 7 cases. The most detailed study of the muscle fibers was made by Ley He found marked degeneration present in 3 uteri studied This seemed to be more marked in regions where the hæmorrhage was greatest, but was not limited to such areas, and, in his opinion, was not secondary to the hæmorrhage but was due to the same cause, namely the action of a toxin. The process was severe enough in some areas to reduce the muscle bundles to a 'vacuolated matrix in which lie a very few tortuous, narrow hyper and hypo-chromatic nuclei." The individual fibers in such areas could not be recognized.

The decidua The changes in the decidua are always worse in the decidua basalis than in the parietal decidua. Hæmorrhage is the most marked

decidual vessels show congestion. In the case of Young (the specimen of the case reported clinically by Kynoch) it is stated that the decidual vessels were dilated into enormous thin walled sinuses. Ley mentions a partial closing of the decidual vessels by proliferation of the intima in one case and some perivascular infiltration in another Inflammatory lesions were not noted in any case and their absence was noted specifically in a few cases.

The blood vessels Congestion, particularly of the veins, is quite uniformly present. Thrombosis of the veins in the uterine wall particularly in the neighborhood of the placental site, is noted in several cases. Couvelaire and Williams noted solutions in the continuity of the walls of some veins communicating with the areas of effusion. Williams and Morse the walls ates that countered

in the uteri of multiparous patients. Mazzini noted thrombosis in some vessels and a homogeneous appeara

thrombc

each side, especially the left. The uterine vessels seem to be healthy ' Perivascular infiltration was noted by Ley, who also states that the changes in the vessel walls did not seem to differ from those noted in the surrounding tissues. Berggren v Weiss, Fraipont, Couvelaire, Essen-Moeller and of subperitoneal has already been the peritoneum,

however and one of great importance from both a clinical and pathological point of view, is the pres ence in many cases of fissures or ruptures in th peritoneum extending occasionally to the depth of few millimeters into the subjacent muscularis These are noted in 11 cases. (Essen Moeller Fraipont, King, Knauer, LeLorier Ley McNair

over the placental site and such a location is definitely shown in 3 cases. I have not included in this series several cases in the literature in which these peritoneal fissures have been noted in associa tion with accidental hæmorrhage but in which nothing is said regarding hæmorrhage into the uterine wall. There would seem to be little doubt, however that these belong to the type of condition under discussion. Such cases are reported by White, Shannon, Macirone, and Werner The case of White is particularly interesting because it is in all oplexy X para, tillborn

fœtus. Nothing is said about external or concealed hæmorrhage but autopsy showed the characteristic peritoneal lacerations, hæmorrhagic extravasations into the broad ligaments, and intra abdominal bleeding This case was reported in 1834.

clear serum to pure blood. The amount varied from a slightly increased quantity of peritoneal fluid to an intra-abdominal hæmorrhage quite comparable to

In one case it came from ruptured vessels in the broad ligament, in another is believed to have come from the wall of the tubes, and in still another was at least contributed to by complete rupture of the uterus. The cases with bloody serum frequently showed no peritoneal tears, the opposite being true when free blood was present

The adnexa. Not the least interesting feature of the pathology is the participation of the tubes, ovaries, and uterine ligaments in the hæmorrhagic process. The broad ligaments were involved in 26

of punctiform hæmorrhage. In one of Williams

on the

TABLE II.—PATHOLOGICAL DATA IN FORTY-SIX CASES

(Case numbers in this table correspond with those in Table I)

Case No.	Infiltration of the Uterine Wall	Muscle Fibers	Decidua	Blood Vessels	Peritoneal Lacerations	Adnexa	Intraperitoneal Effusion	Other Organs
1	Marked ecchymosis at the fundus. Round-celled infiltration around some of the hemorrhagic areas.			Walls normal in appearance		Broad ligament is infiltrated. Right tube filled with blood	Blood and serous fluid	
3	Bloody effusion under the serosa				On posterior surface at long axis of uterus	Effusion in broad ligaments	Free blood	Chronic nephritis. Hemorrhagic hepatitis
4	Small hemorrhages between the muscle bundles toward the decidua		Cellular degeneration and hemorrhage	Normal				Kidneys parenchymatous nephritis and edema. Liver necrosis and hemorrhage. Pulmonary tuberculosis. Hemorrhage in membranes of brain
6	Veins under the peritoneum	Healthy			One tear about one inch long over placental site			
7	Uterine wall appeared ecchymotic						Much blood or bloody serum	Kidneys chronic parenchymatous nephritis. Liver central necrosis, advanced grade
8	Numerous punctiform hemorrhages and subserous effusions							Hepatic cirrhosis and chronic nephritis
9	Irregular subperitoneal hemorrhage, chiefly around the cornua					Large extravasation in left broad ligament. Both tubes contained blood	3 ounces of free and clotted blood	One small hemorrhage on the convexity of the pleura, another on the visceral pericardium
	Marked throughout. Much worse in area of placental attachment, here all layers are involved. Elsewhere worse in middle and superficial layers. The muscle bundles are separated and even individual fibers disconnected		Parietal, normal, basilar, more or less marked because of hemorrhagic infiltration	Large and congested but intact, all their walls and endothelium normal		Punctiform hemorrhagic changes in walls both tubes and in both ovaries. Both broad ligaments infiltrated		Focal Macroscopical examination showed hemorrhagic effusions into the liver, kidneys, adrenals, and cerebral meninges
	Limited to the placental area. Edema	Appear normal		Walls of some veins have given way. Tissue of the arteries intact and normal. Some perivascular infiltration		Diffuse ecchymosis in both broad ligaments		
13	Worse at the placental area. Wall involved to depth of one inch below the peritoneum. Lower uterine segment not involved. No edema			No changes in the vessel walls		Ovaries and left tube normal. Right tube and broad ligament infiltrated	Slight bloody effusion in the cul-de-sac	Parenchymatous degenerative lesions in kidneys. Liver normal on gross and microscopical examination
14	Ecchymosis				On posterior surface of fundus		Blood and bloody serum	

25	Muscle bundles disorganised by oedema and haemorrhage			Polymorphonuclear leucocytosis present in abundance in some vessels, but the structure of the walls is normal. No inflammatory reaction			Free blood	
26	Oedema. Hæmorrhagic leakage through vessel walls. Infiltration worse at placental site	No evidence of degeneration anywhere	Expansion of the vessels into enormous thin walled mosses. Here and there areas show haemorrhage Changes most marked in the basalis	Congestion of those in the uterine wall, otherwise healthy Massive, extensive and fairly old standing thrombosis of the ovarian veins, especially the left				
27	Present				Present			
28	Marked throughout, from decidua to the serosa opposite Edema. Occasional collections of leucocytes in greater numbers than can be accounted for by the effused blood	Appear degenerated and necrotic in many poorly			Slight abrasion on posterior surface involving peritoneum only	Large hematoma in left broad ligament, extending up behind the sigmoid	N free blood present	
29	Free blood among the muscle bundles. Large amount of fibrous tissue but no increase in amount of elastic tissue				Present, on posterior surface	Both broad ligaments swollen and infiltrated, large hematoma in the right Infiltration extends up behind the cecum	½ pint of free unclotted blood	Kidneys normal on gross and microscopical examination
30	Present					Ruptured veins in right broad ligament source of free blood	Large amount of free blood	
31	Both recent and old hemorrhages extravasated; some proliferation of connective tissue, some recent cellular infiltration	Many fibres show degeneration	Areas of hemorrhage				60 grams of extravasated blood in cul-de-sac	
32	Marked throughout all layers, especially at the placental site	No degeneration		No visible alterations of the walls	a transverse fissure on posterior surface of fundus, directly over placental site, extending a few millimeters into the musculature		litre of blood	No lesions in lungs, liver spleen, kidneys, or intestines on gross examination
33	Present					Broad ligaments infiltrated		
34	Worse on posterior wall and right side placenta on posterior wall		Normal; no trace of inflammation	Few hemorrhages in the walls of many veins communicating with the adventitia Thrombosis of the smaller veins. Degenerative changes in the walls of smaller arterioles Main trunks of the vessels normal	None	Right broad ligament and lateral two-thirds of tube infiltrated	N free blood	Placenta normal

TABLE II. PATHOLOGICAL DATA IN FORTY SIX CASES—*Continued*

Case No.	Infiltration of the Uterine Wall	Muscle Fibers	Decidua	Blood Vessels	Peritoneal Lacerations	Adnexa	Intraperitoneal Effusion	Other Organs
35	Œdema. Hemorrhage not apparently connected with larger vessels. Mass in outer half		Inflammatory changes, some small hemorrhages areas	Superficial veins distended. Veins near the placental site filled with thrombi. Degenerative changes in the walls of smaller arterioles. Main uterine and ovarian vessels normal	None	Right broad ligament, tube and ovary infiltrated	Quantity of clear serous fluid	Placenta normal
38	Patchy effusions under peritoneum. Cut surface black from effused blood	Disintegrated				Tubes, ovaries, and broad ligaments all involved. Ecchymoses extend onto bladder in front and up behind cæcum on right and sigmoid on left		Placenta normal. Fetus chocolate colored intestines, bloody effusions under peritoneum and bloody serum in the peritoneal cavity
39	Hemorrhage under peritoneum and in superficial layers of the myometrium					Large hematoma in left broad ligament, none in right	Much part of free blood	
40	Hemorrhage under peritoneum and in superficial layers of the myometrium					Both broad ligaments enormously distended with large hematomas	No free blood	
41	Hemorrhage under peritoneum and in superficial layers of the myometrium					Very large hematoma in left broad ligament and smaller in right	No free blood	
42	Hemorrhage under peritoneum and in superficial layers of the myometrium					Large hematoma in right broad ligament, none in left		
43	Ecchymoses				fissures, critical, on posterior surface of fundus		8 ounces free blood	
46	Numerous subserous hemorrhages. Patchy distribution of infiltration. Placenta on the anterior wall	Apparently healthy			Numerous on intra uterine surface, directly over placental site. Some extend into musculature		24 ounces of free blood	Anemic but apparently free from disease
47	Ecchymosis							Acute toxic degeneration of the liver no normal liver tissue left
48	Present	Undergoing degeneration		Thrombosis of some vessels, walls of others present homogeneous appearance congestion of the submucous vessels		Punctiform hemorrhages in left tube and ovary. Left broad ligament infiltrated		Torsion of left horn of uterus deciduoma rise to right

51	Worse at attachment of broad ligaments to fundus Infiltration extends to a depth of .5 to 1 cm beneath the peritoneum Worse on anterior wall while placenta as on posterior wall. Oedema Hemorrhages from capillaries. Inner layers of myometrium normal	Disassociated	Numerous hem orrhages into basalis No leucocytic in filtration	Uterine and ovarian vessels normal in appearance and not thrombosed Thrombosis of several veins in uterine wall at placental site. Arterioles show degeneration and thickening of subendothelial tissues		Tubes and ovaries not involved. Upper and median portions of broad ligaments infiltrated	Small amount of serous fluid	
52	Most intense in outer half of wall Oedema	Disassociated	No inflammatory changes	Veins engorged and dilated No thrombosis Arterial changes similar to those in case 5		Tubes and ovaries not involved Ecchymotic spots in upper portions of both broad ligaments		
54	Subperitoneal patches of effusion Wall infiltrated throughout				Peritoneum raised in large blebs filled with blood; one had ruptured		Free blood	
56	Ecchymosis worse on right side and anterior wall, distinctly worse in superficial layers Placenta on anterior wall No oedema	No changes	Hemorrhagic areas Some areas show degeneration	Veins congested vessel walls normal, no thrombosis of ovarian or uterine vessels	None	Ovaries normal Both tubes, both broad ligaments, and round ligament infiltrated	400 ccm. blood-stained fluid	Subcapsular hemorrhages in liver; no necroses Degenerative lesions in kidneys. Numerous subcapsular hemorrhages in adrenals
57	Distinctly worse under peritoneum No oedema			No changes				Subcapsular hemorrhages in liver Punctiform hemorrhages in mucosa of stomach
58	Only at placental site and only to a depth of 0.5 mm. under the peritoneum No oedema			No changes in vessel walls or thrombosis		Not involved	No effusion	
60	Subperitoneal ecchymosis only						About 2 pints of serosanguineous fluid	
6	Subperitoneal ecchymosis				Present	Both broad ligaments infiltrated		Generally anemic, otherwise normal kidneys normal on macroscopic examination
62	Marked. Oedema	Marked degeneration and necrosis Placental site and throughout the uterine wall	Basalis infiltrated with blood	Slight perivascular infiltration Muscularis elastic by principally of the intima of the larger arteries Decidual cells partly cleared by proliferation of intima		Both broad ligaments infiltrated Tubes and ovaries normal	Large amount of free blood and clots (Rupture of uterus)	Oedema and degeneration of kidneys Fatty granules in liver cells, most numerous in center of lobules
64	Infiltration marked, in places worse over decidua, in others under peritoneum. Oedema	Marked degeneration and necrosis		Perivascular infiltration slight. Intimal proliferation in few large elastic Swelling and oedema of walls of veins and arteries Changes in vessel walls resemble those in surrounding tissues	Not present	Upper portion of left broad ligament infiltrated	Some blood stained fluid	Degenerative lesions in kidneys
65	Infiltration marked, in places worse over decidua, in others under peritoneum Oedema	Marked degeneration and necrosis		Perivascular infiltration with lymphocytes in uterine wall and decidua			No free blood present	Severe parenchymatous degeneration of liver and kidneys Diaphragm shows extensive hemorrhage into lymphatics beneath the pleura

TABLE II. PATHOLOGICAL DATA IN FORTY-SIX CASES—*Continued*

Case No.	Infiltration of the Uterine Wall	Muscle Fibers	Decidua	Blood Vessels	Peritoneal Lacteals	Adnexa	Intraperitoneal Effusion	Other Organs
46	Subperitoneal hemorrhage in region of cornua				Transverse lacteals in part, not in part, one involving part of, or other lacteals slightly		M. P. [illegible] to fr blood	
47	Most marked in regions of right cornua. Placental site pushing out right lateral wall. Hemorrhage subperitoneal in this region	All stages of degeneration in cornua	Normal	Thrombosis of vessels in uterine wall	None	Right broad ligament and half of right tube involved	No free blood	Placenta normal except for infarcts. Liver multiple subcapsular hemorrhages, parenchymatous degeneration and fatty degeneration in kidney
48	Present				None	Tubes and broad ligaments mild	None	
49	Ecchymosis over left cornua. Placenta on left cornua. Hemorrhage in left wall of uterus	Appeared normal			Patches observed appearing as though vessels filled with blood. Lacteals not distended	Tube and ovary. Left broad ligament infiltrated	Considerable blood stained serum	Liver central lobular degeneration. Kidneys acute parenchymatous degeneration. Other organs [illegible] Placenta [illegible] normal

usual lesion, but was occasionally extensive enough to quite disorganize it. The process in the broad ligaments varies greatly in its extent from the presence of ecchymotic spots to collections of blood which justify the term hematoma. The hemorrhage being free and the other involved, or the process is much worse on one side than on the other. Where this obtains there is distinct evidence to show that the severity of the condition is governed mainly by the location of the placental site, being worse on the side toward which the placenta tends to have its greatest area of attachment.

The placenta. With the exception of infarcts and the compressed zone corresponding to the area of the retroplacental hematoma, the few recorded examinations of the placenta have shown an absence of pathology. Slight thickening of the stroma of the villi was noted in a few cases.

Lesions in other organs. There are more or less complete autopsy notes in 17 cases. The lesions in the liver are hemorrhage, usually subcapsular and acute parenchymatous degeneration. Hemorrhage without necrosis was present in 2 cases. Degeneration was noted 7 times and was central in 2 cases and peripheral in 1. Hepatic cirrhosis was noted once. In 1 case it is stated that no normal liver tissue was left. The liver is stated to have been normal on macroscopical examination once and normal on both macroscopical and microscopical examination once. The usual lesion in the kidney was acute parenchymatous degeneration this is noted 7 times. Chronic nephritis is noted twice. The kidneys were reported as normal on gross examination once, and on microscopical examination once. Hemorrhage in the diaphragm was present twice, in the pericardium once, in the meninges once, in the mucosa of the stomach twice, and in the adrenals once. One patient had apical tuberculosis.

The fetus. There are 2 autopsies on the fœtus reported, one by Couvelaire, and one by Oldfield and Hann. In each instance extensive hemorrhages into various viscera were noted. Are these lesions the result of the asphyxia caused by placental separation, or are they a manifestation of the activity of the same hemorrhagic toxin probably responsible for the similar lesions in the mother? As yet this question can not be answered. It is interesting to speculate however in view of recent claims that cerebral hemorrhage in the newborn is often not of traumatic origin but due to dyscrasias of the fœtal blood whether a possible antenatal poisoning of the fœtus may not exist in some cases, which will enable us to trace an etiological relationship between cerebral hemorrhage in the newborn and maternal toxemia.

PATHOGENESIS

Clinicopathological summary For the purpose of considering its pathogenesis, the picture of uteroplacental apoplexy detailed above may be summed up as follows The placenta, normally located in the upper part of the uterus, is either partially or totally separated from its attachment to the uterine wall The resulting intra uterine bleeding may remain entirely concealed, but more frequently is manifested by external hæmorrhage. The uterine wall is the site of a hæmorrhagic extravasation, of varying extent and severity, which, however, tends to be worse in the neighborhood of the placental site and in the superficial, subpentoneal, rather than in the deeper layers. Œdema is frequently present. The muscular fibers frequently show varying degrees of degeneration which may be very marked and extensive The most constantly present vascular lesion is thrombosis of the smaller veins, especially back of the placental site The decidua, particularly the decidua basalis, is the site of a hæmorrhagic infiltration and frequently shows necrosis. In about 15 per cent of the cases tears of the peritoneal coat are present. These may involve the myometrium to a depth of a few millimeters and are usually located over the placental site Intra abdominal bleeding from them is usually present and may be severe, or the effusion may be only a bloody serum The broad ligaments, tubes, and ovaries are also very frequently the site of a hæmorrhagic infiltration. In about 90 per cent of the cases there is either clinical or pathological evidence of a toxæmia.

Theories regarding the causation of the lesion The following theories have been advanced in the attempt to explain the causation of these lesions

1 That the distention of the uterus from the intra uterine hæmorrhage results in stretching its wall sufficiently to produce tearing of the vessels

2 That the blood in the uterine wall is forced into it through its contraction over the intra uterine hæmorrhage

3 That obstruction to the venous flow from the uterus through torsion or other misplacement, or through thrombosis of the large venous trunks, results in a back pressure causing the smaller veins and capillaries to give way

4 That the condition is the result of a toxæmia.

The first three of these hypotheses may be grouped together for consideration, as they all look toward a mechanical production of the lesions

The mechanical theories Morse has shown that filling the uterus of a pregnant bitch with salt solution, almost to the bursting point, will produce separation of the placentæ and abortion, but that hæmorrhage into the wall of the organ does not occur It has already been seen, also, that the majority of cases in this series was of the frank type and in many of these the external bleeding was not merely symptomatic but sufficient in amount to constitute a real menace to the patient, and yet in such cases the hæmorrhagic infarction has frequently been of a very severe grade In the case of acute distention of other hollow viscera, short of actual rupture, hæmorrhage into the wall rarely occurs, and there seems to be no particular anatomical reason why the uterus should be an exception to this rule. Furthermore, the distention of the uterus in accidental hæmorrhage is rarely of the degree seen in acute hydramnios, which, so far as is known, does not cause hæmorrhage into the uterine wall.

That the hæmorrhagic infarction is not the result of the forcing of blood into the myometrium from the intra uterine hæmorrhage is evidenced at once by a glance at the pathological picture If this were so the infiltration should certainly be worse in the layers immediately adjacent to the decidua, instead of under the peritoneum, as is true in the great majority of the cases. Moreover, it seems difficult to believe that the attachment of the membranes to the uterine wall would resist separation more than the wall itself would resist infiltration Hæmorrhage among muscular tissues elsewhere in the body normally searches out the lines of least resistance along the fasciæ and intermuscular septa It seems reasonable to suppose that this is what occurs in accidental hæmorrhage and the occurrence of frank bleeding in the majority of cases

demonstrates that a force necessary to drive the effused blood into and throughout the uterine wall would first, and before such a point was reached, determine separation of the membranes and external hæmorrhage, thus relieving the intra-uterine tension.

Obstruction of the venous flow from the uterus is held to be the causative factor by Young, and also by Morse the former believes the obstruction to be due to thrombosis of the large veins the latter looks to various malpositions of the uterus, torsional or otherwise, to cause the obstruction and thinks the failure of the relaxed abdominal wall of the multipara to provide proper support to the uterus may be an important factor Young's case was the only one in the series in which extensive thrombosis of the large veins was noted and even here it was limited to the ovarian system, the uterine veins being normal. On the contrary, careful examination of the large veins, in several cases, failed to show the presence of thrombi. The experimental work of Morse on the uteri of pregnant rabbits, in so far as it can be applied to conditions in the human uterus, to my mind only serves to negative the hypothesis it is supposed to prove. He notes the fact that each horn of the rabbit's uterus is drained by three sets of veins, ovarian, mesometric, and uterovaginal. Ligation of any one, or of any two sets of these veins resulted only in temporary congestion of the horn and did not deleteriously affect the pregnancy When all three sets were ligated a condition was produced which clinically and pathologically corresponded to uteroplacental apoplexy This result might have been reasonably expected it would seem, but the further conclusion would be justifiably deducible, that such a result could be produced by nothing short of complete obstruction of the circulation. That this is true is proved by other experiments of the same authority who found that torsion of a pregnant uterine horn in the rabbit, on the axis of the vagina, through an arc of 180 degrees would produce placental separation but no intramural hæmorrhage. Not until the torsion had reached two complete rotations, was such a lesion produced.

The cases of Glinski, and of Mazzini cited by Morse as corroborative clinical proof of his contention tend it seems to me, to further indicate its fallacy In Mazzini's case, which I have included in this series because there was an undoubted hæmorrhagic infarction of the uterus present, the pregnant horn of a uterus didelphys was found definitely rotated through an arc of 180 degrees. In Glinski's case which I have not included because, while the uterus was congested and bled freely and the placenta was partially separated, there was no definite evidence of hæmorrhagic infiltration there was a torsion of the uterus through an arc of 270 degrees. No other observation of malposition of the uterus has been noted, and Couvelaire, in comparing the appearance of the uterus in one of his cases to that of an ovarian cyst with a twisted pedicle, expressly states that the uterus was only rotated to the degree usually found present in pregnancy While it is true that the pathology observed in pedunculated myomata and in ovarian cysts which have undergone torsion is not dissimilar to that in the uterine wall in the cases under discussion, here again, definite torsion frequently of an extreme degree, is always present. In veterinary practice a condition of torsion of the pregnant uterus with hæmorrhage and placental separation is observed but the torsion in these cases is sufficient to obstruct entrance into the uterus through twisting of the vagina or cervix (Rey Williams) It is interesting to note that this was true in the case of Mazzini. It will thus be seen that in every clinical and experimental case in which a condition analogous to uteroplacental apoplexy has been produced through obstruction to the uterine circulation from torsion, the latter has been definite, of a marked degree, and easily demonstrable. It should be further noted that none of the mechanical hypotheses, with the possible exception of circulatory occlusion, offers a satisfactory explanation of the occurrence of the punctiform hæmorrhages in the tubes, ovaries, and uterine ligaments.

The most important objection which can be urged against the adequacy of any of the mechanical hypotheses, however, is their failure to account for the occurrence of the associated toxæmia. It is true that Morse states he has some experimental evidence to

show that torsion of the pregnant uterus in rabbits produces a toxæmia associated with renal lesions and albuminuria. His experiments along this line are as yet unpublished but it would seem entirely possible that such a torsion, which would probably close the uterus and prevent its emptying itself and at the same time cause fœtal death from placental separation, would, if it did not cause maternal death, rapidly result in a toxæmic state. Young, also, claims that the toxæmia occurring in accidental hæmorrhage is secondary, and not primary, to the placental separation. Briefly stated, his theory is that the toxæmias of pregnancy, including particularly eclampsia, are the result of the absorption into the maternal circulation of toxins derived from autolysis of infarcted areas in the placenta. His views have not received general acceptance and it is difficult to see, if his theory is correct, why toxæmia should not be a constant finding in those cases of placenta prævia in which, instead of one sudden, copious hæmorrhage, smaller hæmorrhages at intervals, spread over a period of weeks or even months, pointing to frequent separations of small areas of placenta. In addition, the clinical evidence adduced in the series of cases under discussion shows very definitely that toxæmic symptoms may precede the actual occurrence of placental separation for a varying period In one of Smyly's cases this was true for a period of one month.

The toxæmic theory If, then, we are justified in concluding that uteroplacental apoplexy is not the result of the operation of mechanical causes, except in such exceptional circumstances as those noted in Mazzini's case, the negative evidence that it must be the result of a toxæmic process becomes quite convincing But the positive evidence is even more so It has been shown that clinical or pathological evidence of toxæmia is present in approximately 90 per cent of the cases. In 8 7 per cent there has been an associated eclampsia. The degenerative parenchymatous lesions in the liver and kidneys, the hæmorrhages elsewhere in the body, in a word the whole clinical and pathological picture, is definitely toxæmic in character In accord with this view are found practically all who have studied the subject, among whom may be mentioned Bar, Couvelaire, Essen Moeller, Williams, Smyly, and Ley

The nature, method of action, and source of the toxin If it be granted that the lesions with which we are dealing are the result of the action of a toxin, in the absence of definite knowledge of its toxicology we can draw conclusions as to its nature only from a study of the lesions which it produces Of these the most striking is hæmorrhage Williams has compared the pathological picture of uteroplacental apoplexy to that caused by the venom of certain snakes. The comparison is indeed striking The venom of all the viperine snakes, especially that of the American Crotalinæ, possesses hæmorrhagic properties of a marked degree, as has been shown clinically by Willson and experimentally by Flexner and Noguchi The elaborate studies of venom made by the latter have demonstrated that these poisons contain protein toxins capable of producing hæmorrhage by a variety of mechanisms, namely by inhibiting coagulation, by producing thrombosis, and by endotheliolysis. These toxins they have termed hæmorrhagins. The hæmorrhages in the uterine wall and in the adnexa, as has been previously shown, are associated with thrombosis of the smaller veins The source of the bleeding has not been shown to have been arterial in any case, but solutions in the continuity of the vein walls, communicating with the areas of effusion have been noted although the capillaries are probably mainly at fault. Such findings point to a process of endotheliolysis. Nor are clinical observations lacking that an inhibition of coagulation may be present. In this series, Snowden's case had oozing from the abdominal incision for several days, Keyworth's case had persistent oozing from superficial abrasions of the vulva and subcutaneous ecchymoses were noted in the cases of Smyly and of Knauer DeLee has also reported a fatal case of accidental hæmorrhage associated with a hæmorrhagic diathesis and Harrar has observed subcutaneous ecchymosis in the same condition

Uteroplacental apoplexy is believed to be, then, a manifestation of the action of a toxin

which possesses properties justifying its being termed a hæmorrhagin. Acting on the tissues of the decidua basalis it produces small areas

produces lesions of continuity in the veins and capillaries, and also probably hæmorrhage by diapedesis. It causes thrombosis of the veins, and a resulting local passive congestion may contribute to the giving way of the vessels. In the decidual, muscular and peritoneal tissues its toxic action tends to produce necrosis. The explanations of the peritoneal lacerations which have usually been attributed to the distention of the uterus, is, in all probability along toxic lines. The weakened and devitalized tissue gives way to the pressure of subperitoneal collections of blood. One of Smyly's cases shows this most strikingly for at operation it was found that the peritoneal covering of the uterus was in places raised in large blebs filled with blood one of which on the posterior surface had burst, the rent being about one inch long and there was free blood in the peritoneal cavity.

It is next necessary to examine the evidence to see if it will justify drawing reliable conclusions as to the source of the toxin. It has usually been held that there was present a general maternal toxæmia, probably closely related to eclampsia. The latter point will be dealt with later. The question here is as to which is the primary lesion, the infarction in the uterus or the general toxæmia. If we accept the hypothesis that the general toxæmia is primary it becomes necessary to assume it would seem, that we are dealing with a toxin of hæmorrhagic properties with a selective action on the tissues most involved that is the decidua, myometrium para

toxæmia of the mother as the important etiological factor how else can the pathological picture be explained? If there is a generally and equally distributed hæmorrhagic toxin present, bleeding should be much more frequently encountered throughout the body instead of in the uterus and adnexa in such overwhelming degree. It might be suggested that the toxin has an affinity for the tissues of the decidua basalis, produces bleeding there, and that the conditions throughout the uterus are secondary to the placental separation. But such a mechanical explanation has been shown to be untenable.

On the other hand if we accept the hypothesis, here advanced for the first time that the source of the toxin is the placenta, the pathological data accurately support this contention. The sequence of events may be briefly sketched as follows. Through the operation of unknown factors, a dysfunction of the placenta becomes established resulting in the formation and liberation into the blood stream of the mother of a toxin of the nature of a hæmorrhagin. Being absorbed from the placental site the hæmorrhagic tendency of the toxin would be first and most strongly manifested here. Hence the lesions would be worse in the uterus and its adnexa, and along the path of their lymphatic and venous drainage namely behind the posterior parietal peritoneum as in the cases cited. The tendency of the hæmorrhagic extravasation, œdema, necrosis, and peritoneal laceration to be most intense at the placental area is explained. Recalling the rich network of blood and lymphatic vessels just below the peritoneum the accumulation of the toxin in these accounts for the greater extravasation almost uniformly noted in the superficial layers of the myometrium and under the peritoneum. The general distribution of the toxin throughout the body results in producing renal and hepatic degenerative changes, and occasionally but not universally the hæmorrhagic nature of the poison is manifested elsewhere by the occurrence of hæmorrhages in various viscera, ecchymoses in the skin etc. The hypothesis which I wish to advance may be briefly summed up as follows. There is a

secondarily produces manifestations of a general toxæmia.

Relation to the other toxæmias of pregnancy. This question, naturally of the greatest im

portance and interest, is, unfortunately, in the present state of our knowledge, impossible of very definite discussion The consensus of those who have most studied the subject seems to be to accept a close relationship between uteroplacental apoplexy and eclampsia, and in this series, eclampsia was a complication in 8 7 per cent of the cases. This view of the matter can not be better summed up than by quoting Essen Moeller, who says after mentioning the opinion noted above

> Are there any facts supporting such an opinion? In the first place it must be remembered that the coincidence of eclampsia and accidental hæmorrhage is by no means rare. Many such cases have been published and among my cases I have had 2 Moreover in cases of eclampsia we not infrequently see bleeding in and on the placenta. To this may be added that bleedings in the inner organs in eclampsia are rather frequent. Liver spleen kidneys, brain are often found to be the site of ecchymoses or greater bleedings. Having now learned that bleedings are frequent in the muscle of the uterus, I think we are right in assuming that these bleedings may have the same cause as the others. And last of all It is striking how often the general state of the patient in a case of accidental hæmorrhage resembles an intensive intoxication as we see it in eclampsia.

mon in eclampsia, may also be of some importance for the separation of the placenta. The albuminuria would thus only be a symptom of the general intoxication, which in one case causes eclampsia in another case accidental hæmorrhage, in a third perhaps both of these diseases. But this does not, of course, give any explanation as to the origin of the accidental hæmorrhage The problem will then form a part of the great problem of eclampsia or of the toxæmias of pregnancy But the fact that two groups of symptoms, which we formerly took to be indicative of two different diseases, can be looked upon from a common point of view seems to be an advantage.

Such are the grounds upon which uteroplacental apoplexy is tentatively related to eclampsia. Should this view of the matter prove to be correct, and should my own contention that the pathological picture points to the placenta as the source of the toxin, receive acceptance, we will have at least some evidence that a placental dysfunctioning is primarily responsible for the occurrence of both conditions It does not seem entirely improbable that quantitative or qualitative variations in the toxic output of the placenta may well account for quite extreme variations in the resulting clinical picture.

In this connection, however, certain discrepancies must be noted Thus eclampsia occurs with greater frequency in primiparæ than in multiparæ, where in this series only approximately 25 per cent were primiparæ. Furthermore, eclampsia exhibits no especial tendency to recur in subsequent pregnancies whereas Couvelaire and others have remarked on the tendency of accidental hæmorrhage to recur, and a history of accidental hæmorrhage or toxæmia in a previous pregnancy was not infrequently noted in the cases in this series This problem must be left to the future for solution

RELATION BETWEEN UTEROPLACENTAL APOPLEXY AND ACCIDENTAL HÆMORRHAGE

The question naturally comes up Are all cases of accidental hæmorrhage toxic in character? While not denying the possibility that traumatism may be an occasional factor in producing placental separation, I believe with Essen Moeller that such cases are exceptional and that the toxic cases predominate. In the present state of our knowledge we can only assume reasoning from analogy with other conditions, that variations in the toxic qualities and amount of the toxin, and the duration of its excretion, may determine wide clinical and pathological differences The presence of albuminuria in a large proportion of the cases of accidental hæmorrhage

justify the conclusion that similar lesions, of a milder [illegible] cases o come t considers this point, and says "I have collected, in addition to my 3 cases 23 cases published since Couvelaire a paper in 1911, showing hæmorrhagic infiltration of the uterus while at the same time I have found 15 cases in which the description was sufficiently clear, even when the point was not definitely mentioned, to justify the conclusion that no

infiltration was present.' It is entirely possible to believe, however that a careful microscopical examination of such uteri would demonstrate slight hæmorrhagic lesions in the decidua basalis or uterine wall. My own belief is that practically all cases of premature separation of the normally implanted placenta will ultimately prove to be caused by the same placental poisoning which in extreme cases produces the typical picture of fulminating uteroplacental apoplexy

CLINICAL CONSIDERATIONS

As this paper is not concerned with the general subject of accidental hæmorrhage, it is necessary to take up here only the points on the clinical side on which light may have been thrown by the study of uteroplacental apoplexy

Symptoms With the exception of showing the symptoms of toxæmia to a more marked degree the cases in this series have presented only the usual symptoms of accidental hæmorrhage, namely sudden onset of constant abdominal pain shock, external bleeding ligneous consistency of the uterus, and

uterine wall and its inability to control hæmorrhage by the normal mechanism of retraction and contraction.

Diagnosis The diagnosis of uteroplacental apoplexy can be *definitely made only by* direct inspection It should be suspected in all the more serious cases of accidental hæmorrhage, and marked evidence of toxæmia, or severe postpartum hæmorrhage point strongly to its presence.

Prognosis This is uniformly grave. The maternal mortality was 38 per cent in 50 cases diagnosed during life. The fœtal mortality was 92 5 per cent in 67 cases.

selves in connection with the subject of treatment. In the first place it must be borne in

evidence of filling with blood or of interference with its function, and the constitutional symptoms are slight or entirely lacking Here it is, of course unwise to be stampeded into an unnecessary radicalism Such cases are best left to the unaided efforts of nature. In the severe cases, *especially where the* evidence of toxæmia points to the serious involvement of the uterine wall, the situation is most critical, and an intelligent radicalism will probably in most cases prove to be most conservative In such cases the points to be borne in mind are the damaged state of the uterine wall and the possibility of intra abdominal and postpartum bleeding When *the condition of the cervix permits immediate* vaginal delivery this should be accomplished as promptly and conservatively as possible. In the management of the third stage the nicest judgment will be necessary The first evidence of postpartum hæmorrhage should indicate the most thorough and immediate packing of the uterus The occurrence of bleeding through the packing or a progressive *deterioration of the patient's general condi* tion should be met by immediate abdominal hysterectomy

In the severe cases occurring before or early in labor there can be no question that immediate operative intervention is urgently indicated I have no hesitancy in saying that the abdominal route should always be selected and that vaginal hysterotomy has no legiti*mate place in meeting such a situation.* The abdominal operation gives immediate control of the sources of the hæmorrhage and effects a non traumatising delivery at the same time. With the abdomen open and confronted by a typical case of uteroplacental apoplexy what course should be followed? Couvelaire held that a marked hæmorrhagic infiltration of the uterus always indicated a Porro operation This contention has not been generally endorsed The first step should look toward conservative cæsarean section. Every effort

would seem reasonable to believe that the normal involutionary processes would cause rapid absorption of the hæmorrhagic effusion

and return the organ to a condition not incompatible with the performance of its functions in a subsequent pregnancy If, on the other hand, a seriously damaged organ fails to control bleeding too much time should not be lost in the effort to make it do so, and it should be amputated supravaginally Such a procedure might be properly undertaken on slighter indications in multiparæ than in primiparæ. The statistics of this series of cases, previously given, show that conservative cæsarean section offers the greatest hope for recovery After giving due consideration to the fact that Porro operations were probably done in the worst cases my impression is that the better results noted in the conservative operations were not entirely due to this cause

CONCLUSIONS

My conclusions as a result of this study are as follows

1 Uteroplacental apoplexy is caused by the inundation of the uterine wall with a toxin of the nature of a hæmorrhagin, liberated from the placenta, and, naturally, producing its maximum effect at the site of its absorption and greatest concentration.

2 Accidental hæmorrhage is probably, in the great majority of cases, a manifestation of the same process.

3 Clinically, the significant fact in the pathology is the damaged state of the uterine wall, which tends to cause both intra abdominal and postpartum hæmorrhage.

4 In severe cases, with an undilated cervix, the most conservative treatment is abdominal cæsarean section, followed by hysterectomy, if indicated, in order to assure certain hemostasis

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DEPARTMENT OF TECHNIQUE

SOME OBSERVATIONS UPON THE TREATMENT OF HIP-JOINT DISEASE

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Superintendent, Massachusetts Hospital School

THE establishment of a principle which invariably holds true in the treatment of disease is a difficult, if not impossible, attainment, but the exceptional opportunity for the study of hip-joint disease afforded at the Massachusetts Hospital School may serve to bind together some scattered facts for contemplation and lead to a more uniform and rational treatment of this affection.

The Massachusetts Hospital School is a public charitable institution for the care and education of the crippled and deformed children of the State and while it is maintained primarily as a school, it has hospital facilities and a resident medical staff Covering the period of 13 years since the institution was established nearly one thousand patients have been under treatment and of this number approximately one hundred and seventy five children were suffering from hip-joint disease. In the vast majority of these cases, there was apparently no question as to diagnosis at the various hospitals in which previous treatment had been prescribed. In fact the symptoms have been exceedingly conspicuous in practically all the patients received at the State school. Extensive abscess formation has been by no means uncommon and many cases without open sinuses have been found to be rapidly advancing toward suppuration.

That there either had been doubt or uncertainty as to trea [illegible] tion respecting the [illegible] at various hospital [illegible] evident from the histories obtained and from the treatment previously advised. Children with some very acute hip conditions, with marked flexion and adduction deformity, have come in with only a pair of crutches as a means of obtain [illegible] the local [illegible] gical rest [illegible] admitted soon after the earliest appearance of symptoms and others had been given careful and consistent treatment by effective traction and immobilization, by far the largest number had been treated with plaster-of Paris bandages applied in a variety of forms.

It has always been the policy of the institution to procure in all cases the fullest possible previous history obtainable from hospitals and surgeons by whom patients have been treated and, whenever practicable to continue the treatment which had been prescribed. At first the previous treatment was followed for a few weeks at least, provided the patients had been recently under what was thought to be appropriate treatment, but it very soon became apparent that complete physical examinations upon entrance and the progress of the cases could not in this way be followed with the thoroughness which was essential in a State institution. Furthermore when the removal of plaster-of Paris bandages was delayed it was often embarrassing to the administration to attempt to explain to the satisfaction of children a parents how and when abscesses had formed and atrophy and plaster sloughs occurred in parts which had appeared to them quite normal when last seen. For the above reasons rather than because of any prejudice for or against any particular method of treatment, it soon became the universal practice to remove every [illegible] upon [illegible] Thorc [illegible] rays were then made and the patients were put to bed under traction by means of weights and pulleys until the cases were reviewed by the staff or some member of the board of orthopedic consultants and the treatment to be followed agreed upon.

A few of the photographs taken upon admission will not only serve to illustrate some of the problems with which the Hospital School was confronted, but also show the woeful lack of uniformity with which cases of hip disease have been managed.

Figure 1 is that of a (6-year-old) boy upon admission 5 years after the onset of hip disease, for which no mechanical appliance had ever been prescribed. While nature's cure had resulted in some very unfortunate deformities and complete ankylosis of the joint, the next patient (Figures 2 and 3) was found to have deformities to an equally distressing degree after suffering for 3 years with the added burden of a series of plaster of Paris casts. The hip was still sensitive, the femoral head had been destroyed and the destructive process was still going on at a rapid pace. The conclusion may be drawn that the plaster bandages were not properly applied or that successive casts were not made by the same surgeons at out-patient clinics and that the treatment had not been consistently followed.

The patient shown in Figure 4 had been under plaster treatment for about 11 months and the last cast as shown in the picture had been applied just before admission. That the attempt at immobilization was not effective is shown by the space between the thigh and the plaster Pain and adductor spasm were also prominent features.

The extent to which the soft tissues sometimes become involved may be seen in another case (Figures 5 and 6) This patient had been treated with successive plaster spicas for about 18 months. He was in extremely bad health and died shortly after admission. These few cases have been cited and many more could be added to prove why the plaster spica is not regarded with special favor at the Massachusetts Hospital School in which many terminal cases of hip-joint disease are received.

disease in a rapidly growing adolescent girl who had been sent to the State school as a last resort. A heavy burdensome plaster spica was removed and the child relieved of a great deal of pain and made fairly comfortable in bed with the regulation weights and pulley traction. The consultant complimented the staff upon the skill with which the hip was being managed, position

cated that

been extremely painful for a long time, the prolonged suffering being expressed by her features in the clearest manner The relief afforded by the bed traction was also given by the traction splint which, at the same time, did away with the necessity of greatly restricting the child's freedom Her appetite improved from the first, she attended a short daily session of school and improvement to an eventual recovery was most gratifying The merits of the Bradford abduction splint were sufficiently obvious in this case to justify its use in other cases until it gradually came to be regarded as indispensable to the welfare of many cases of hip disease seen at the Hospital School.

Contrary to the opinions of some to whom the advantages of the splint have been demonstrated, it is neither difficult to make and apply nor troublesome to keep effectively in place. How

the ratchet as may be necessary to overcome muscle spasm, is illustrated by Figure 8.

On February 3 1914, a (9-year-old) boy was admitted to the school infirmary by transfer from one of the larger general hospitals in which a heavy plaster cast had been applied to his left hip-joint 3 months previously In September 1913 he had fallen from a fence but no direct injury was suspected until 2 months later when

was made, the regulation plaster cast put on, and he was kept under continuous observation as a house patient until he was discharged to the Massachusetts Hospital School. Upon removal of the plaster spica the superficial veins were observed to be much enlarged and, while there was no localized fluctuation, there was marked swelling about the thigh which extended into the foot. The hip was very painful with marked muscular spasm and the characteristic symptoms of moderate flexion and adduction deformity but no apparent shortening. A positive von Pirquet test was obtained and a deep abscess formation shortly came to the surface in three discharging sinuses. The X ray in this case showed roughening of the upper margin of the acetabulum and lower half of the surface of the femoral head.

This was thought to be a case in which the

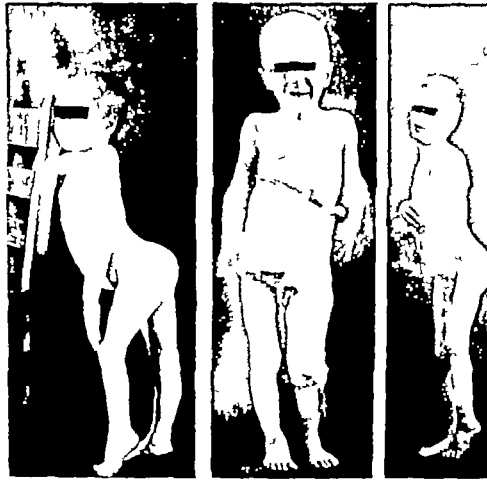


Fig. 1 Fig. 2 Fig 3

Fig 1 Six-year-old boy upon admission to hospital, 5 years after onset of hip disease No mechanical appliances had been applied.
Figs. 2 and 3. Patient 3 years after onset of disease. Treated with a series of plaster-of Paris casts



Fig. 4. Patient had been under plaster treatment 11 months. Note space between thigh and cast.

made and worn for a period of about 2 years, as shown in Figure 9 Improvement was rapid there was a steady gain in weight, the sinuses [illegible] clear of the floor he was [illegible] attend an open-air school. When the newly formed hard tissues were thought to be firm enough to permit moderate weight bearing the traction straps were removed and the splint worn as a perineal crutch In June 1917 when the splint was removed altogether an examination showed apparent recovery without shortening [illegible]

In order that there might be no doubt as to the permanency of the recovery he was examined 2



Figs. 5 and 6. Showing extent to which soft tissue sometimes become involved Patient treated with successive plaster casts for about 8 months

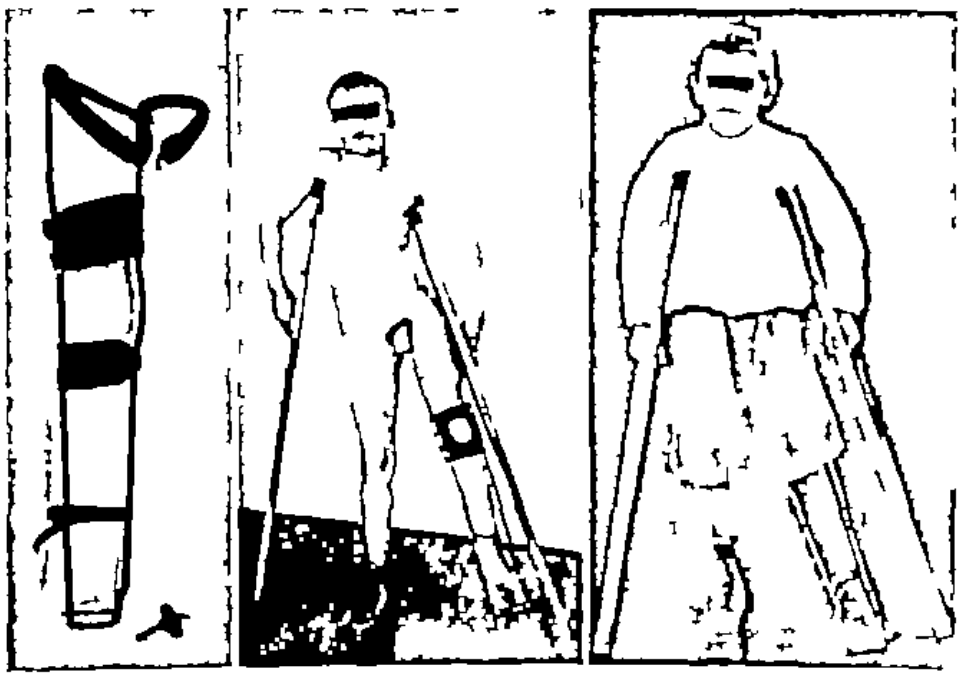


Fig 7 Fig 8 Fig 9

years later and the photographs (Figures 10, 11 and 12) taken for the completion of his case record.

Occasionally cases have been sent to the Hospital School very soon after the first appearance of hip disease and have been treated with the abduction splint from the first Practically without exception these cases, as well as those few for whom the splint had been early prescribed elsewhere and who afterward came to the State



Figs 10 11 and 12 Photographs of patient shown in Figure 9, taken 2 years after discharged as cured.

school to have the same treatment continued, have made good recoveries with motion, which has not been found to be true in the much larger number of cases for whom plaster treatment had been long prescribed

The question has sometimes been raised as to whether patients in whom almost perfect recovery had taken place were not suffering from some other affection than that of a tuberculous invasion of the joint. While it is doubtless true that some recovered cases were not tuberculous, there appears to be no doubt but that many of them were, and after all pathological refinements in diagnosis are not essential to the treatment of an acute destructive disease process in the bones of the hip-joint.

All the cases taken together and considered as a series or group seem strongly to suggest that there is an opportunity for improvement in the management of the average run of cases of hip-joint disease They certainly have given some important evidence of the value of the Bradford abduction hip splint and so favorably has it been regarded by those who have had an opportunity to become familiar with its use in caries of the hip-joint, that it has even been employed with marked success in the treatment of fractures of the neck of the femur

THE CLINICAL ASPECT OF TENDON TRANSPOSITION

By M A. BERNSTEIN M D Chicago

IN former publications[1] I have described a method of tendon transposition which was based upon animal experiments and upon a technique developed on cadavers. The method, in brief consists in transposing a healthy tendon together with its sheath and peritendinous structures,[2] to replace a paralyzed one. In the lower portion of the peroneus longus muscle, a plastic is performed on the sheath to enclose the tendon at that point (Fig 5) This paper deals with the clinical application of these principles, and a report of cases operated upon.

From studies of embryological specimens and anatomical dissections it is found that the tendon with its peritendinous structures comprises an integral unit While the sheath is looked upon as a fluid buffer to protect the tendon from external violence and also as a medium through which the tendon can glide more easily it serves a greater purpose surgically It protects the tendon from traumatism in tendon transposition it permits the peritendinous structures to bear the effects of accidents from infection it preserves the blood supply and prevents the formation of adhesions directly to the tendon

Embryologically there is an early differentiation of tendon and tendon synovia. Long before there is function in the tendon, the sheath is seen in the process of formation. This disproves the theory of Velpeau that function is necessary for its formation. Motion helps to develop not to form, tendon synovia. While it is impossible to state that tendon synovia exists morphologically in the embryo of 2½ months, there is a definite development which indicates that the *tendon sheath* is in a stage of formation. The tendon synovial development begins as a rarefaction of the embryonal tissue about the tendon and is irregular in outline (Fig 1) However it can be seen that this ring consists of two layers, an inner and an outer, and corresponds to the parietal and visceral layers of the fully developed tendon sheath. The tendon sheath soon approximates itself and surrounds the tendon on all of its sides. Cleavage takes place in both layers on the mesial side of the tendon with the formation of mesotendons (Fig 2) When a fully developed tendon is lifted out of its sheath it is found attached to the floor of the sheath by means of these mesi. Above the level of the sheath a special arrangement can be seen Lowell and Tanner say that at the muscular tendinous junction there appears a reflection of a specialized portion of the perimesium. This is composed of areolar connective tissue and is attached to the tendon and the sheath and becomes continuous with the peritendineum externum A fold is formed which allows for contraction and relaxation of the tendon This fold or reflection prevents rupture of the sheath at that point during the phase of contraction. It is claimed that the gliding of the tendon is dependent upon this special arrangement This structure must, therefore, be preserved when the tendon is transposed

I shall not go into further detail of tendon anatomy since it can be found described in articles by Bleskin and Mayer Lowell and Tanner Steindler and others. Suffice it to say that a clear conception of the anatomical relations, and of the physiological functions of these structures is necessary if a functional result is to be expected from tendon transposition

The older methods of tendon transposition namely the anatomical transpositions of Nicoladini, and the direct implantation method of Lange and Drobnik and their various imitators, did not take into account the physiological relations of the tendon to its peritendinous structures These methods emphasized the position of the transposed tendon its exact mode of implantation or insertion, and the technical details of suture Little or no attention was given to the tendon itself or to the conditions which influence its function The effects of surgical trauma were ignored The fundamental physiological conditions upon which the gliding and nutriment of a tendon depend did not receive proper recognition in practical surgery The value of physiolog

mucous character and gives place to the first synovia. My deductions are as follows The tendon, or rather what will eventually become tendon tissue, is seen as a thin homogeneous ring This ring or half ring has no definite rela

Surg Clin. Chicago, 1918, Oct Surg Gynec & Obst 1918, xxvi, 53
Peritendinous structures comprise the sheath, mesotendon, paratenon, and all the structures which surround the tendon

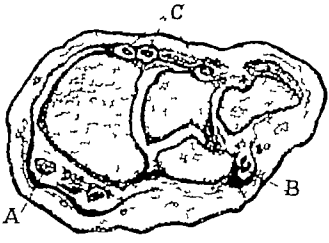


Fig 1 Cross section of ankle of fœtus 3 months old. a Flexor group tibial group There is as rounding th from the cell grouping

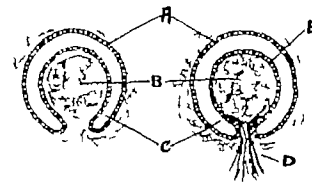


Fig 2 Schematic illustration of the development of the tendon sheath. a Outer sheath wall b tendon c cavity of the sheath d mesotenon e peritendonium externum (epitenon)

ical transposition has, however, been recently recognized Biesalski and Mayer have clearly seen its importance, although in their technique some of the anatomical peritendinous structures are destroyed Mayer s method consists in removing the tendon from its surroundings and from the tendon sheath and transposing it through the sheath of the paralyzed tendon. His criticism of my method is that it is limited in its application and that it is impossible to transpose the peroneus longus with its sheath because the sheath does not completely surround the tendon at the external malleolus, so that a considerable portion of the tendon is deprived of tendon sheath The criticisms advanced by him are not well founded because I have transposed the principal tendons without difficulty and as for the peroneus longus transposition it can be seen that the sheath is transposed without great difficulty

Steindler fully recognizes the necessity for a biological transposition and while avowedly following the method of Biesalski and Mayer insists upon the necessity of supplementing it by the preservation of the mesotenon in order to insure the vitality of the transposed tendon and prevent its fibrosis. He states that when he reoperated upon a case for which a tendon transposition was done by the old method of tendon stripping he found ' that while they (the tendons) had not torn loose from their attachment they had degenerated into fine and insignificant bundles of a few fibers stretching out and utterly incapable of producing any mechanical action ' It would be interesting to know what his findings would be in the cases operated upon by his modification I had occasion to re-operate upon two of my cases, one because the tendon was too long and exercised no movement of the joint although it could be seen to contract the other because the tendon became loosened from its attachment as a result of liquefaction necrosis and became attached to the subcutaneous tissue The tendons were easily isolated from the surrounding tissue and appeared normal A section of tendon was removed for microscopic study and showed no change whatever

Bunnell also recognizes the necessity of preserving and removing the tendon with the intact peritendinous structures He has done complete tendon transplantations in the hand. Unfortunately, the end results of complete tendon transplantation especially in the hands and fingers, are not as satisfactory as we hope to see accomplished in the future.

The methods of practical tendon transposition followed up to the present time have not accomplished the satisfactory results which were claimed for them While these procedures could be relied upon as practicable, yet the functional results were generally poor and a surgeon could not be assured that after the most careful technique and operative care the functional end for which the operation was performed would be effected The whole *raison d'être* of the operation, namely the substitution of a functioning tendon for a paralyzed one generally failed in practice.

The reasons why tendon transposition failed were that the tendon became fibrous adhesions formed between the tendon and the tissue surrounding it in its new position that bony structural changes in the joints were not corrected and that poor tendons were used to replace paralyzed ones. The histological findings in specimens removed when a tendon was trans-

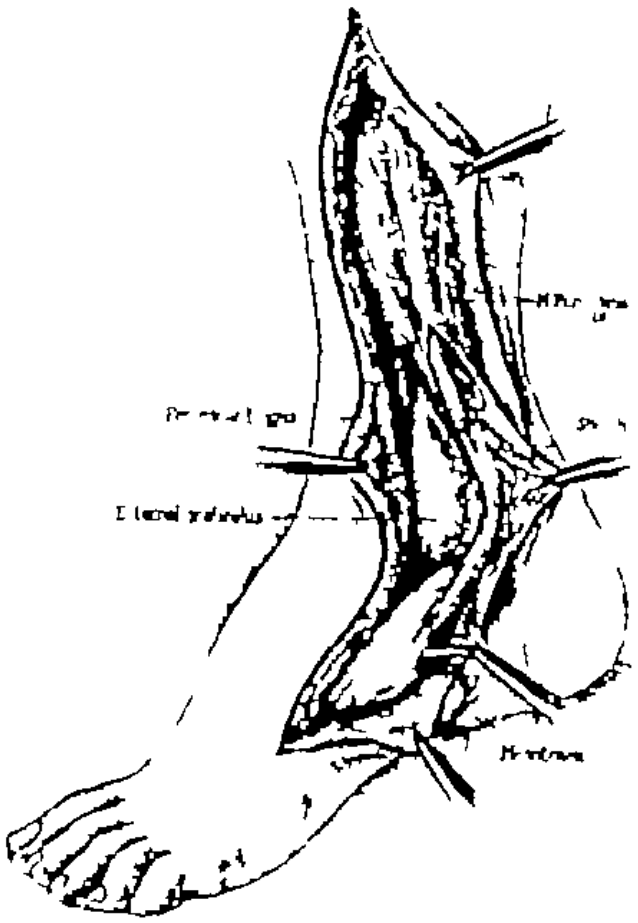


Fig. 3 Incision for transposition of the peroneus longus muscle.

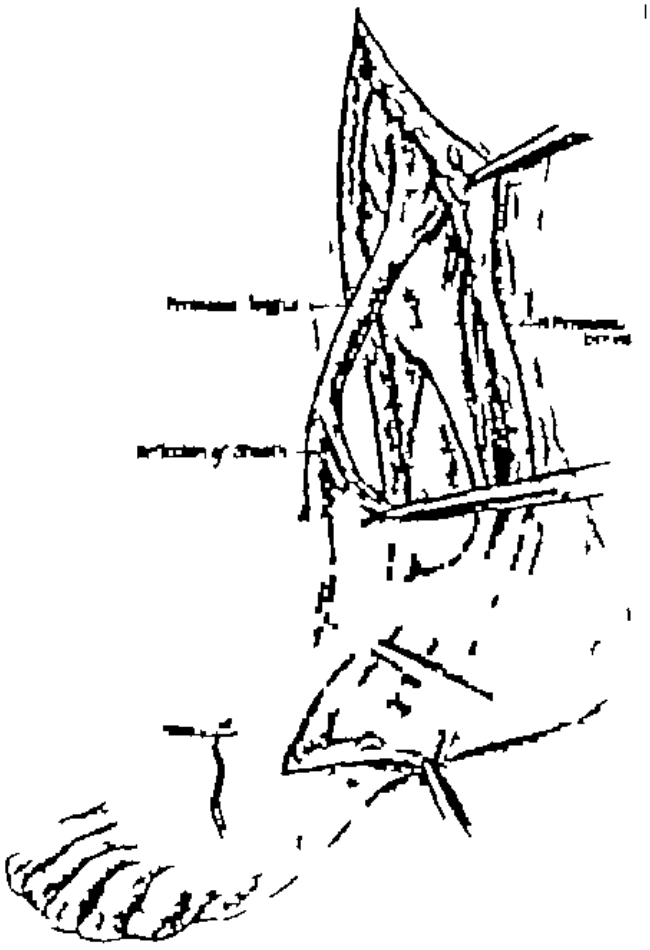


Fig. 4 Peroneus longus tendon dissected out with its sheath Fixation sutures in place Notice the amount of free sheath flap carried over with the tendon

posed by the older methods show that the proliferative and infiltrative changes seriously interfere with function Even when the tendon is

resembles that of a tenovaginitis and adhesions are likely to follow as a result of insufficient absorption It is, therefore clearly evident that when a tendon is transposed together with the

the tendon. When adhesions do form they are to the peritendinous structures and do not interfere with the gliding mechanism Since the blood supply is not materially interfered with by preservation of the mesotenon there is no atrophy or fibrosis of the tendon. The histological results fully justify the transposition of a tendon together with its sheath and therefore this operation may be considered a true physiological method of tendon transposition

Whatever method is employed there are certain practical points to be considered The tendons to be transposed must be strong enough to perform the work imposed upon them A muscle that has been involved in the acute stage of poliomyelitis and has not fully recovered its strength is not fit for transposition. The use of such material is one of the most frequent causes for failure It is not to be expected that a muscle which functioned poorly in its original position will work better when transposed, when it may have to assume still greater obligations

The proper length of a muscle must be provided to give optimum conditions for contraction Often a transposed muscle is seen to contract and yet it produces no movement of the joint This is usually due to too much play It takes very little slack in a muscle to produce interference with function I should prefer to suture a

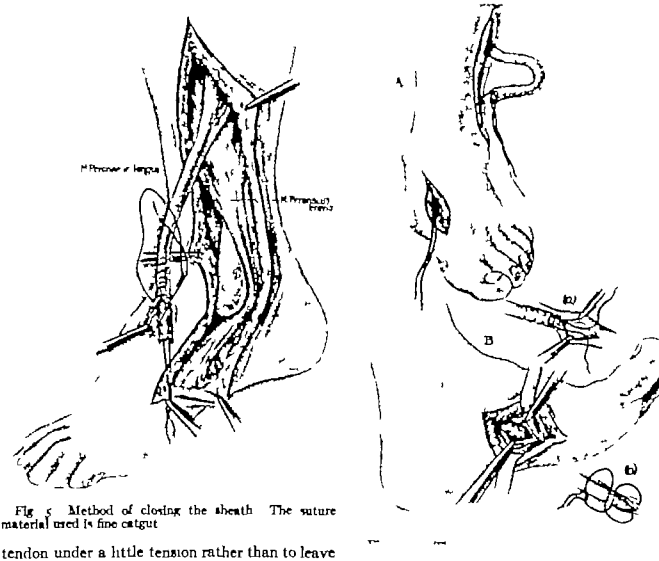


Fig. 5 Method of closing the sheath The suture material used is fine catgut

tendon under a little tension rather than to leave it too long A taut muscle can be relieved by overcorrecting the joint.

We often pronounce muscles permanently paralyzed and subject the patient indefinitely to the wearing of braces or of casts and the result is muscle inactivity, arrest of active circulation and consequently a thin shrunken extremity One must always bear in mind that there is a limit to conservative treatment and plan operative procedures for ultimate correction When a tendon transposition has been done and the result is a failure it is because the surgeon has used bad judgment in selecting his case Merely because an extremity is disabled as a result of poliomyelitis is no indication that tendon transposition will be of benefit One must study the individual case to determine which muscles are paralyzed and which ones have been spared. The operation of tendon transposition should not be made to fit the case but the case selected to fit the operation Often an apparently paralyzed muscle can be made to function when a

receive the transposed tendon The suture goes through the tendon and periosteum of the first cuneiform bone *B* Shows the transposed tendon in place The forceps are upon the retracted tibialis anticus tendon.

healthy muscle is joined adjacent to its point of insertion. To illustrate the tibialis anticus muscle may have lost its function, but the extensor proprius muscle is active and when transposed to the insertion of the tibialis anticus the latter is stimulated to contractility due to the contraction of the former This phenomenon can be explained in this manner first, the relaxed and stretched tibialis anticus is given an opportunity to contract, this being accomplished by taking up the slack of relaxation as pointed out by Sir Robert Jones and second the muscle is permitted to take part in the contraction of the transposed muscle and is thereby re-educated to contractility This phase corresponds to the muscle training of Robert Lovett but in this



Fig 7 a, Paralysis of the anterior tibial muscle and to some extent of the extensor proprius hallucis Taken before operation There was inability to dorsiflex and abduct the foot

b Position of the foot 2 years after operation The peroneus longus was transposed together with the pertendinous structures to replace the tibialis anticus Notice the stability of the foot and the amount of abduction

c, Showing the amount of plantar flexion

d Showing the amount of dorsiflexion of the foot

instance the transposed muscle trains the paralyzed one.



Fig 8 No picture was taken of this foot before operation There was a paralysis of the tibialis anticus but the extensor of the large toe was in good condition The patient walked with a valgus deformity and was

[illegible] stump of the extensor proprius hallucis to the common extensors of the toes This photograph was taken 2 years after operation

The lower picture shows the amount of plantar flexion

CASE 1 This patient was 9 years of age when I first saw him (Fig 3) He had a typical attack of acute poliomyelitis when he was 3 years of age Treatment as carried out by a practitioner consisted of electrical stimulation, massage, etc The ultimate result was a paralysis of his anterior leg muscles namely tibialis anticus, extensor proprius hallucis and to some extent the extensor communis digitorum He wore a brace to correct the resulting valgus deformity but the correction was not accomplished I removed the brace and for many months thereafter treated each muscle with mild applications of the faradic and galvanic current and muscle training There was no response from the stimulation and the muscles regained no strength He was operated upon at Michael Reese Hospital 3 years ago The peroneus longus was transposed together with its sheath and inserted into the split tibialis anticus at its point of insertion subperiosteally into the base of the first metatarsal bone The technique employed may be described as follows

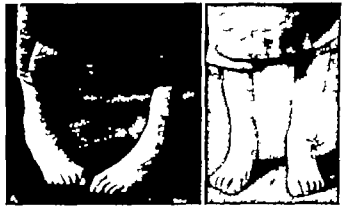
Operation An incision is made beginning at the upper outer third of the leg over the course of the peroneus longus muscle and extending downward curving around and beneath the [illegible]

The peroneus longus is exposed and the deep fascia carefully dissected away The tendon of the peroneus longus is isolated at the lower end of the incision where it passes to the plantar surface of the foot, and is severed Retention sutures are introduced and the tendon is gently



Fig 9. *a* (at left) Paralysis of peroneal muscles Patient had poliomyelitis when a child is now 20 She is unable to abduct the foot

b Three years after operation The extensor proprius hallucis was transposed to the outer side of the foot to the insertion of the peroneus tertius Notice wrinkling of skin over the contracted tendon



were paralyzed and there was very little power in the anterior muscles from contraction

b The tendo achillis was split and detached from the outer surface of its attachment following somewhat the original Nicoladoni operation and sutured to the peroneus longus, after the method of Vulpius Operation performed in April 1913

lifted out of its bed The suture material used for the fixation is kangaroo tendon The method of inserting the suture must be such as not to constrict the tendon bundles. I have therefore employed a method which I call the 'herring bone stitch (Fig 6 *b*) (I have found that by using silk a considerable amount of constriction is produced which causes pressure necrosis with liquefaction of the tendon at the point of insertion This is discovered about the tenth day after the operation and is shown by the discharge of a serous exudate which resembles infectious material It is needless to say that the occurrence of such an accident is detrimental to the entire operative procedure since the tendon is entirely loosened from its periosteal moorings and assumes a subcutaneous fixation) The tendon is now removed from its surrounding tissue by means of a scissors, taking with it as much of the peritendinous structures as possible When the external malleolus is reached it is found that the peroneus longus and brevis occupy the same synovial compartment, and that the two are intimately connected for about an inch and a quarter The roof of the canal is now cut. This corresponds to the lateral ligament of the ankle-joint and fascia cruris and therefore must be respected The tendon is delivered from this canal and is found attached to the floor by means of the mesotendon which at this point is about 6 centimeters in length. This is cut as low down and as far away from the tendon as possible and releases the tendon to the point where it is surrounded by its own sheath (Fig 4) The tendon with its sheath is isolated to beyond the musculotendinous junction This is done to assure direct muscular pull A plastic is performed upon the lower portion of the sheath (Fig 5) This is done in the following manner (I wish to call special attention to this part of the operation since I have received numerous inquiries to clarify this step)

Two Allis forceps are placed upon the free flap and the flap stretched out. Great care must be exercised in doing this since this part of the sheath is veil like and tears very easily The [illegible] surrounds the tendon on all of its sides, leaving only a small portion of the tendon exposed at the point for insertion

A tunnel is made by passing a large veterinary eye probe downward and inward along the course of the tibialis anticus muscle forcing it down to the point of insertion of that tendon A curved incision is made over the tip of the probe which corresponds to the insertion of the tibialis anti



fairly useful large toe An arthrodesis was performed between the calcaneocuboid bones, to give the foot more stability

cus muscle, and the tip of the probe is delivered The two ends of the probe are seized and moved from side to side so that the width of the canal is increased It is necessary to incise the fascial planes at the point of entrance of the transposed tendon so that the tendon will not become strangulated (Fig 6 *A*) The probe is threaded by means of the kangaroo fixation suture and is pulled down The tendon is steadied and prevented from twisting and brought out at the lower point of the incision

The tendon does not pass superficially beneath the skin but is found to pass beneath the annular ligament The tendon is fixed to its new position as (Fig 6 *B*) It is advisable not to constrict the tendon at this point by placing too many fixation sutures because of pressure necrosis The skin is closed with catgut and a circular cast applied, extending from above the knee and including the toes Returning now to the long posterior incision the cut lateral ligament is sutured by a continuous fine kangaroo tendon Care must be taken to suture the structures around the external malleolus very carefully so that the integrity of the joint is not destroyed The cast is retained for 6 weeks, when it is entirely removed and active and passive motion carried out for 10 days, when walking is permitted At the end of this time there is a physiological fixation of the tendon to its new point of insertion, and one is perfectly safe in permitting the use of the foot

In every case of poliomyelitis there is some shortening of the extremity and it is necessary to have a properly fitted shoe with an insole padded to compensate for the loss in length of the leg

CONCLUSIONS

Tendon transplantation has a definite indication in the operative treatment of anterior poliomyelitis If the results obtained are not satisfactory the indications in a broad sense were not well defined

Tendons should be transposed from the same plane when possible When transposed from an opposite group muscle training must be carried out over longer periods

Tendons must be transposed with their sheath and peritenous structures so that the vitality of the tendon is not interfered with

When a tendon is transposed with its sheath adhesions are not likely to occur

The operation must be carried out with care, avoiding trauma, exposure of the tendon to the air and with as little handling as possible.

A MAMMOTH OVARIAN TUMOR

By JAMES W WARD M.D San Francisco

MRS J F age 47, first came under my observation in 1890 when I was called to attend her during an attack of peritonitis which appeared in some way to be related to an ovarian cyst of moderate size The patient s symptoms were abdominal pain and tenderness, vomiting fever and abdominal distention From this attack she made a prompt recovery and

I was not called again until the summer of 1907, some 14 years later when I found her in a most deplorable condition. The tumor had attained tremendous size and

completely

Her history save a reported above was practically negative She was of American birth Her mother died

labor and the puerperium.

Physical examination December 17 1907 The patient has an anxious expression and a staring look She has worn glasses for the last 3 years *The head is negative* save fo

any pal

half

mous abdominal tumor and the lower ribs are markedly everted The breasts are atrophied. Breathing is rapid

whipcords lie over the anterior surface From pubis to xiphoid the distance is 4 feet 4 inches From pubis to the most dependent part of the tumor is 32 inches The girth

could be palpated

The anterior thighs are covered by the tumor An extensive tense *oedema* involves both limbs from the iliac regions and buttocks downward

The reflexes are present and normal in the triceps and wrist They are not obtainable in the lower limbs because of the oedema and immobility due to the weight of the tumor

to the

On rectal examination, the tumor is felt crowding down

gravity is only 1,006

to the family

4 gallons of a dark syrupy fluid, colloid in character was removed. After a mid line incision the tumor was found to be adherent to the peritoneum The adhesions were *extremely dense and the sac was freed with the very greatest* difficulty since it was adherent to the peritoneum

Inspection of the enormous sac showed here and there areas of cystic hemorrhage There were no papillomata, although some of the partitions presented evidence of *rupture*

The liquid and semifluid contents weighed 202 pounds

A casual review of the literature supports the belief that this tumor is the largest yet reported Gould and Pyle in their extensive compilation of unusual cases in medicine mention none larger than 182 pounds (Reifenyden s case) while all the others are 150 pounds or less. The texts usually state that the size of the growths is limited only by the distensibility of the abdomen and the resistance of the patient and some (as Penrose) mention without reference that cases attaining a weight of 200 pounds have been recorded

A careful review however reveals five cases 225 pounds or larger, viz. Binkley 225 pounds, Tuffier 235 pounds, Bullitt 245 pounds, Barlower 298 pounds and finally Spohn s remarkable case



Photograph of patient lying upon operating table and tumor supported on second table

in which he estimated the weight of the tumor at 328 pounds. Four other cases of more than 200 pounds are recorded 29 weigh more than 150 pounds, 78 more than 100 pounds, 191 more than 60 pounds.

Two methods of arriving at the weights of the tumors have been used, yet both are subject to certain inaccuracies. The first adds the weight of fluid removed to that of the sac and when accurately controlled as in our case is probably perfectly reliable. Yet fluid may be lost at operation when the exact amount is difficult to determine. In other cases, as Spohn's and Barlowe's the patients were tapped one or more times before the final removal of the tumor and the amount of fluid due to reaccumulation is of course unknown. Peaslee considers 2 pounds a day a very rapid rate of reaccumulation yet the question is so complex that it is hard to settle. In many of the older cases, which were merely tapped, the weight of the fluid only could be obtained and we must either accept the author's estimate or ignore the weight of the sac, which may be considerable, even up to 50 pounds.

The other commonly used method subtracts the weight of the patient after operation from her weight previous to it. It is, however rarely possible to weigh a patient immediately after operation and at a later time her loss in weight from cedema or her gain in weight from improved nutrition, are factors that must be considered, though fortunately they often counter

liberal estimate of the error by any of these methods of determination and this is a small factor when we consider the enormous weight of the larger tumors

Of great interest is the fact that in spite of the progress of modern surgery 25 or nearly one third of the total number of cases of more than 100 pounds have been reported within the last 20 years. It may be that the greater rarity of larger

portion

case, r

been remarkable enough to report in any age as would Tuffier's 94 liter case published in 1906 or Pfachler's 97-kilogram growth in 1904 since Peaslee in his monograph of Ovarian Tumors in 1872 states "The largest amount of fluid in

being still left as he could not complete the operation Emmett, in 1879 stated moreover that Dr Keith had removed a tumor weighing 120 pounds, the largest ovarian tumor ever removed successfully from the living body" Nor as we might suppose, do all the present day cases come from remote districts, since Smith's 192-pound case reported in 1906 had received elec

almost in the shadow of one of the larger Berlin hospitals.

As long as people live in superstitious fear of surgery or fall into the hands of charlatans for treatment, these very large tumors will occasionally arise.

TECHNIQUE OF RADIUM TREATMENT OF CANCER OF THE PROSTATE AND SEMINAL VESICLES

By HUGH H YOUNG M.D F.A.C.S BALTIMORE
From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital

At the International Medical Congress, London 1913 in the Section of Urology, Pasteau and Degrais presented a method for the treatment of cancer of the prostate with radium. The technique consisted simply in introducing a silver tube containing radium to which was attached a long wire which was employed to introduce the radium into the catheter to the proper distance, into the urethra, where it was left in place for an appropriate length of time. In Figure 1 the catheter with radium in place is shown schematically. Being impressed with the good results which Pasteau had secured in two cases by this extremely crude apparatus I secured 10·2 milligrams of radium element in a glass tube and set about to construct more accurate instruments for the introduction of radium into the urethra prostate, and rectum. The first instruments employed were provided with a straight cystoscope the same cystoscope which I had used for several years in the construction of my cystoscopic resorgeur (Fig. 2). With this cystoscope as a basis, the instrument shown in Figure 3 was made and it at once became possible to introduce radium not only into the urethra and rectum but into the bladder where under cystoscopic direction it could be placed against the urethra or at the vesical orifice or even against the trigone as it is easily possible by simple manipulation to determine where the instrument is in its relation to the vesical neck or to place the radium exactly where it is desired and then hold it there with the clamp. For the rectum the cystoscopic instrument was manifestly not necessary as the radium containing beak could easily be placed at the desired spot along the posterior surface of the prostate or vesicles or along the pelvic wall and held there by the clamp. We therefore constructed instruments of appropriate form not containing cystoscopes for treatment through the rectum, urethra at the vesical neck or through the trigone and base of the bladder to the region of the seminal vesicles.

Figure 5 shows the present form of instrument which is employed for these treatments. The radium is contained in a small platinum tube which is surrounded by a metal cap covered with hard rubber thus affording screening for both the α and β-rays, and also the secondary rays. The ball is placed at the end of the rod thus facilitating usage in both rectum, urethra and bladder the small handle at right angles to the shaft facilitates operation, and indicates the direction of the beak.

Recently since the introduction by Barringer of the needling method for the treatment of carcinoma of the prostate through the perineum I have made up in the workshop of the Brady Urological Institute an instrument which contains within the beak four needle points each containing 12½ milligrams of radium surrounded by a [illegible] through the perineum.

against the desired area for the entire period of treatment. Casting about for an instrument, I made use of the cystoscopic clamp or artificial hand which I had employed for several years to hold a photographic cystoscope in place during exposure of the plates. A ball of appropriate size was then placed around the shaft of the radium applicator which, when firmly grasped by the cystoscopic clamp held the radium instrument in its grasp upon the desired spot. The completed instrument is shown in Figures 3 and 4. This then was the basis for a series of instruments which have since been constructed, the object of which has been to place radium upon a certain spot under the direction of either the cystoscope in the bladder or a finger in the rectum and to hold it there during the entire treatment seance.

It soon became evident that it was not necessary to use the cystoscope for applications of radium in

TECHNIQUE EMPLOYED

In the preliminary study of the cases a careful diagram showing the size and consistence of the prostate is made, utilizing a rubber stamp outline of normal prostate and vesicles as a basis. In making the examination with the finger of the left hand the outline chart is drawn simultaneously, careful attention being made to get an accurate reproduction of the size and induration of the



Fig 1 Catheter method of Pasteau and Degrais for applying radium in cancer of the bladder and prostate

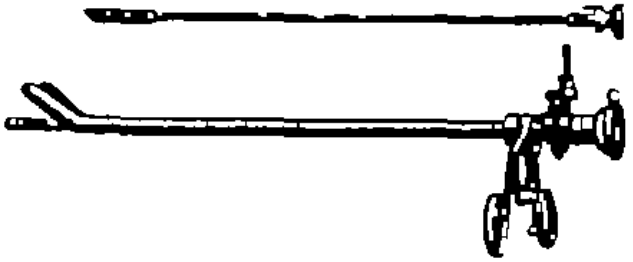


Fig 2 Author's cystoscopic rongeur for obtaining sections of vesical tumors for microscopic study



Fig 3 Author's cystoscopic radium instrument carrying a tube of radium in fenestrated platinum capsule in beak, closed with obturator

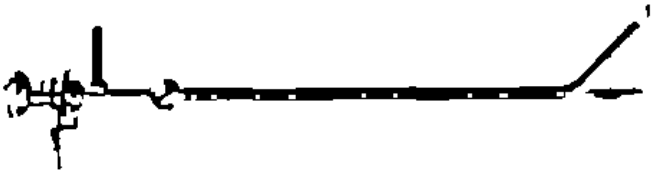
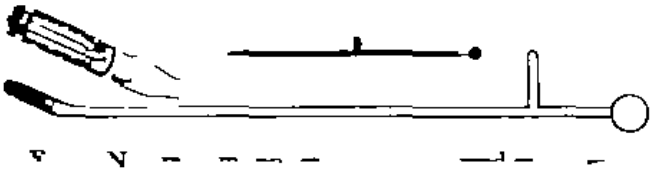


Fig 4 Instrument with straight cystoscope introduced



Fig 5 Rectal radium carrier applied under direction of index finger in rectum, and held in place by mechanical hand or clamp



mass The degree of induration is indicated on a

two parallel lines) great induration such as is characteristic of carcinoma A typical chart of carcinoma of the prostate and seminal vesicles is shown in Figure 7

If the diagnosis is clear from the extreme induration of a portion of the prostate and the absence of calculus from the X-ray examination a cystoscopic examination may not be carried out As a rule cystoscopy is much more painful in cases of carcinoma than in cases of hypertrophy and if it is not necessary for diagnosis we usually do not insist on cystoscopy If there is a question as to the diagnosis, cystoscopy is performed and is of diagnostic importance first because in cases where hypertrophy is present, the prostatic orifice usually shows no intravesical lobes or enlargement more than a small median bar or minute rounded lobe, and second because there is shown by examining with the finger in the rectum and cystoscope in the urethra a marked increase in the suburethral portion of the prostate, not merely in the prespermatic or subcervical group of glands, but also beneath the entire prostatic urethra from the vesical orifice to the apex, and this increase in the suburethral portion of the prostate is usually associated with marked induration This is based on the pathological fact that prostatic hypertrophy almost never involves the so-called posterior lobe which lies between the posterior capsule and the ejaculatory ducts above and the lower portion of the prostatic urethra below and that the same region is strangely the point of predilection for carcinoma This diagnostic sign was first pointed out by me 16 years ago and has been of great value in the diagnosis of early and doubtful cases

The diagnosis of carcinoma having been made, the question arises as to whether a radical operation can be carried out with the probability of success We have now had sixteen cases in which we have carried out our radical technique and are able to report over 50 per cent apparent cures followed over a period of 5 years or more, and in the last four cases by a modification of technique, through which the preprostatic vessels, nerves, and fascia are preserved intact, complete urinary continence has been obtained

Experience has shown that in cases in which the carcinoma is confined well within the capsule of the prostate in which it has involved only the

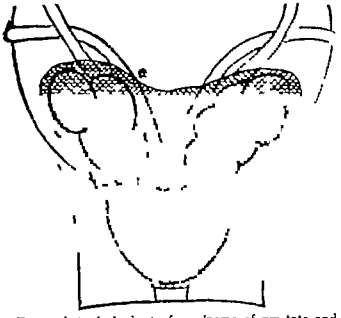


Fig 7 A typical chart of carcinoma of prostate and seminal vesicles.

lower portion of one or both seminal vesicles and in which it has not penetrated the prostatic capsule or fascia of Denonvilliers which covers not only the prostate but the seminal vesicles, the radical technique can be carried out with strong probability of a complete cure and a good functioning bladder with perfect control and without urethral stricture at the site of anastomosis.

Unfortunately the great majority of cases present themselves much too late the disease has already progressed well up along the sides of the seminal vesicles, and frequently involves the lower pelvic glands, only forming a plateau of marked induration above the prostate in the intervesicular region In many of these cases there is no marked urinary disturbance beyond a slight residual and some increased frequency owing to the fact that carcinoma of the prostate tends to invade the structures above, behind the bladder and does not penetrate or ulcerate until later into the urethra or bladder On this account operative relief for the obstruction is usually not necessary and one is free to choose methods of attack upon the carcinoma which is usually producing symptoms due to its size and pressure upon nerves and adjacent structures. The plan of procedure for thorough treatment with radium which was first proposed by me before the American Urological Association at its meeting in Baltimore, 1915 and subsequently presented in a paper(1) has been carried out in over one hundred cases, the results of which will be presented in an accompanying paper by Dr Clyde L. Deming resident urologist of the Brady Urological Institute.

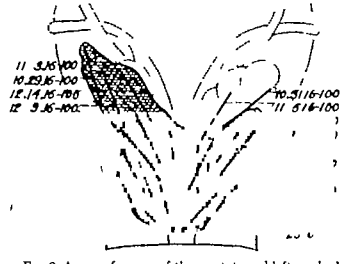


Fig 8 A case of cancer of the prostate and left seminal vesicle (right vesicle slightly involved) The radium treatments, each representing 100 milligram hours, are shown and date of each is recorded.

In my first paper Figures 8 and 9 the charts of cases were presented in which 100 milligrams of radium was applied for one hour each by rectum urethra and bladder to various positions. In one such case it was given twenty-one times through the rectum and fourteen times through the urethra and bladder as shown in Figures 10 and 11 The only modification which has been made in the past 4 years has been to employ an instrument the beak of which is protected by a gutta percha cap scrupulous care being taken to avoid applying radium twice in

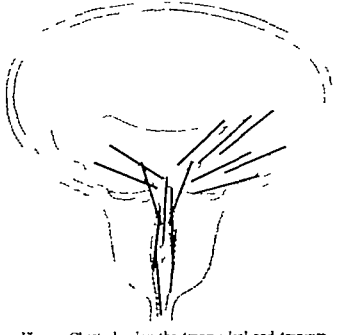


Fig 9 Chart showing the transvesical and transurethral treatments given in each case illustrated in Figure 8 Each line represents 100 milligram hours.

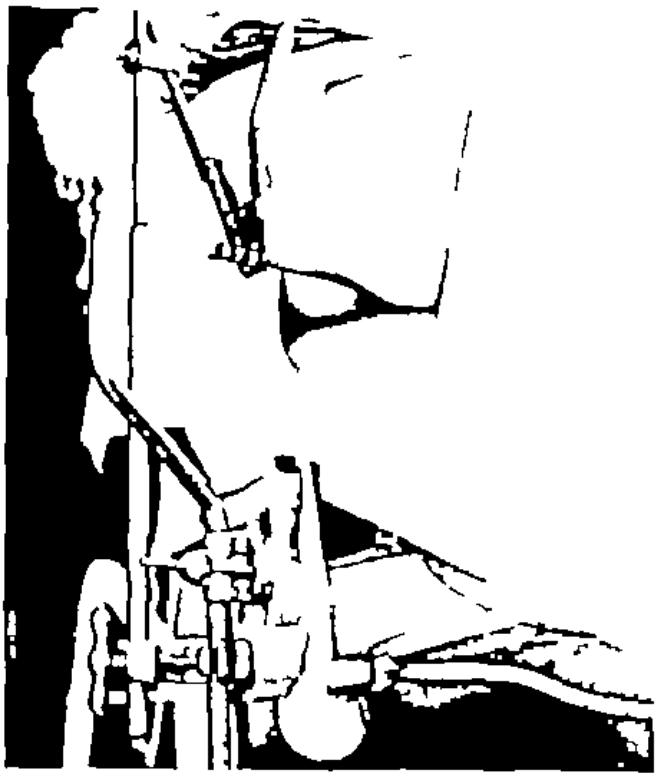


Fig 10 Mechanical hand in use in treating cancer of seminal vesicles and prostate through rectum

the same place generally the successive treatments being given to places quite remote from each other and alternating between the rectum urethra, and bladder Before the introduction of these methods it was freely stated that it was impossible t
through th
burns By
radium is placed in position with the finger in the rectum and held there by the cystoscopic clamp care being taken to avoid regions that have already been treated until 2 or 3 weeks have elapsed radium burns and even pronounced irritation have been practically eliminated so that we now find it possible to give with impunity

least four or five separate and isolated positions) and through the trigone and lateral portions of the base of the bladder are of very great importance as only the mucous membrane and submucous tissues separate the radium from the carcinomatous prostate or vesicles. Since the introduction of Barringer s needles, we have added this method of treatment to our routine technique, and now employ two needles at a seance each of which, containing 12½ milligrams, is in-



Fig 11 Mechanical hand or clamp holding radium instrument in position desired

serted through the skin of the perineum (which has been cocainized) into one or both prostatic lobes or even into the carcinomatous mass above the prostate or along the lateral wall of the pelvis in the region of the seminal vesicles (Figs 12 13 and 14) These needles are allowed to remain in place for a period varying from 18 to 24 hours. They are introduced under the direction of a finger in the rectum (which should not be cov

during the first series of treatments and adds a valuable amount of radiation to the central portions of the prostate and seminal vesicles where it is most remote from the radium applied through urethra, bladder or rectum. As at present given one complete series consists of an hourly treatment of 100 milligrams of radium properly screened and applied with the special applicator alternately 20 times through the rectum, 10 times through the urethra, and 10 times through the trigone and also 12½ milligrams 8 times through the perineum As noted before in these regions there is sufficient area to provide for treatments which do not overlap or repeat at the same spot and therefore do not produce ulcerations. With such a series of treatments most amazing resorption of extensive carcinomatous involvement of prostate and seminal vesicles and tissue adjacent to them is obtained in the majority of cases, and along with it there comes a disappearance of pain and obstruction, a return usually to more normal urination and freedom from straining which is indeed remarkable Figure 10 shows



Fig 12 Radium needles being applied Finger in rectum determining course and position of needle



Fig 13 Sagittal section to show finger in rectum and position of radium needle.

radium applied through the rectum with patient upon his side and the clamp in operation. Figure 13 shows the instrument in place for treatment of the urethra or bladder

Recently I have constructed an applicator which carries in the beak two tubes of radium 100 milligrams each, placed end to end and thoroughly screened with 2 centimeters of platinum and a thin layer of gutta percha. This materially shortens the treatment as 200 milligram hours is given each hour with this applicator instead of 100 milligram hours

DETAILS OF TREATMENT

Before mounting the table patient should empty bladder and if necessary evacuate bowels For treatments through the rectum no anæsthesia is necessary For the urethra and bladder it is well to inject 4 per cent procaine before introduction ment In some cases treatments can be given twice a day but usually the patient objects and one treatment of 1 hour each day is all he will take We usually alternate between urethra rectum and bladder picking each time an invaded region which has not been previously treated The record of treatment is made upon either the prostatic or urethral and bladder chart as shown in the accompanying cases. A line is drawn showing exactly where the radium was applied and the date is indicated on the line which points to the site of application The treatments through the perineum with needles is indicated in a similar way upon a third chart, thus the entire treatment is recorded simply upon one page and the operator ed que four in number are made two weeks apart. These show the progress of the case and often demonstrate remarkable disappearance of extensive infiltration and induration as shown in some of the cases charted below The subject of results, however, will be left to Dr Clyde L Deming who will present a careful study of over one hundred cases. It is necessary to explain that during the period of the war the vigorous attack which had been outlined in our first paper was not carried out, and many of the cases in which Dr Deming is forced to report received inadequate treatment but they may be used to show the imperfect results obtained by insufficient treatment and to be contrasted with those which have been thoroughly radiated according to the method above outlined In a certain proportion of cases, probably 10 per cent, obstruction persists and the presence of residual urine and frequent urination necessitated operative removal of the obstruction In these

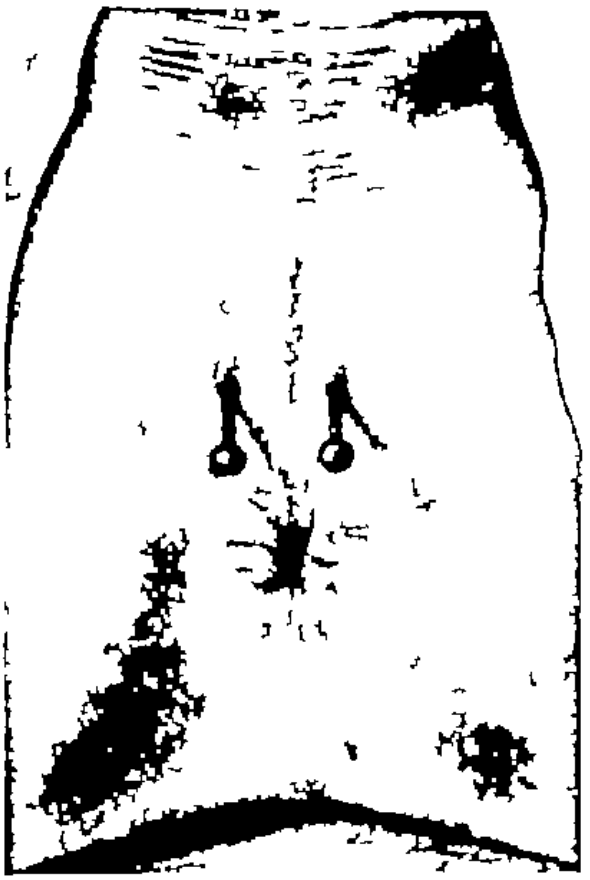


Fig 14 Radium needles in position

cases I have pursued a plan which I have employed in carcinoma of the prostate (associated with hypertrophy or with great obstruction) since 1905 viz. conservative perineal prostatectomy with enucleation of the obstructing median and lateral lobes and careful preservation of the urethra and ejaculatory ducts Almost invariably the patient is given as thorough a treatment as possible with radium through the rectum urethra, and bladder before the prostatectomy is carried out During this course of radium treatment in most cases the obstruction disappears but in others operation is necessary and the results obtained are generally functionally as good as in benign hypertrophies. In some cases radium is introduced into the prostatic cavities at operation, but care must be taken to protect the rectum by sponges and rubber protective which hold the radium sufficiently far away from the rectum [1]

RÉSUMÉ

In conclusion it may be said that by the technique which we have above outlined really remarkable results are often obtained in apparently incurable and very extensive cases of carcinoma of the prostate and seminal vesicles Extraordinary functional results are sometimes obtained with relief of pain hæmaturia, difficulty and fre

l

definitely upon this point Suffice it to say that in a desperate class of cases a great boon can often be furnished and their remaining months or years at least made far more comfortable

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In recent case of carcinoma of the prostate and right seminal ves

RESULTS IN ONE HUNDRED CASES OF CANCER OF PROSTATE AND SEMINAL VESICLES, TREATED WITH RADIUM

By CLYDE L. DEMING M.D., BALTIMORE
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I Results of Radium Treatment in 100 Cases of Cancer of Prostate and Seminal Vesicles

BY the use of surgical, internal, and autoserum therapy science has failed thus far to produce satisfactory results in the treatment of extensive carcinoma of the prostate As a consequence medicine has turned its attention in another direction namely to the use of radium Many institutions have been using radium for a number of years and now private physicians are tempting its healing qualities. The many details of this treatment are by no means well understood as indicated by the different forms of radium used the amounts used and the large number of instruments invented for its application Yet the world having been aroused by the great possibilities of the γ rays, is anxiously await of this fatal disea cancer so with content to wait a reasonable length of time before a cure can be definitely determined. Prostatic cancer is one of the slowest growing malignancies and even after an elapse of 4 or 5 years after treatment, we may not be justified in pronouncing a cure Hence we must expect results will be given with a great deal of caution. However we feel that the time limit is past and we are apprehensive to receive the results which have already been obtained.

The paper by Dr Hugh H. Young on Technique of Radium Treatment for Cancer of the Prostate and Seminal Vesicles shows an evolution in the technique of applying this means of treatment which has been devised by him at the [illegible] nt of [illegible] mistakes. The results during such progression must be expected to show variation. This paper shows the results obtained at the Brady Institute in 100 cases of prostatic cancer treated with radium

The statistics extend over the war period during which time the great care and precision of treatment could not be carried out. Some cases were receiving too large doses at one sitting, while others were receiving too frequent treatments in the same area, and still others were receiving in adequate doses. All cases included in this series were patients with advanced and extensive cancer who were considered beyond the operable stage

The study of incidence of these 100 cases shows that the youngest to develop such an advanced type of cancer was 45 years and the oldest was 84 years The largest percentage of cases is found in the seventh decade which includes 45 per cent. Thirty five per cent occur after this decade and 80 per cent after the sixtieth year

TABLE I—AGE ON ADMISSION FOR TREATMENT

No of Cases	Year	Percentage	Decade
3	45th to 50th	3	Fifth
17	51st to 60th	17	Sixth
45	61st to 70th	45	Seventh
25	71st to 80th	25	Eighth
10	81st	10	Ninth

The diagnosis of cancer was made in all cases by rectal examination. All cases presented the same physical findings as did 175 others which were operated on in this clinic, and all proved microscopically to be cancer The prostate was enlarged, broad, irregular nodular fixed, and stony hard. The seminal vesicles when invaded were found broad, flat, indurated forming an intravesicular plateau In many of the cases lymph glands were palpated along the lateral walls of the pelvis. The seminal vesicles were involved in 90 per cent of the cases. The membranous urethra was invaded in 51 per cent It was broad hard, firm and in some cases presented a tubular like growth. The rectal wall was invaded in 15 per cent of cases No ulcerations were found in the rectal mucosa. All cases then were typical of extensive cancer growth.

The amount of radium used varied greatly ranging from 300 to 6225 milligram hours, the average being 1600 milligram hours, but this average is no criterion for ideal results as will be shown later in this paper The radium was given in courses or series extending over a period of 4 to 6 weeks after which there was an interval of

rest for 2 to 3 months when the second series was given. The largest number received only a single series, while a few received as many as five series extending over a period of 2 years

The treatments were administered per rectum, per urethram, and per vesicam and a combination of these as described by Dr H. H Young (1) Fifteen received rectal treatments alone, three urethral alone and one intravesical alone Fifty received a combination of rectal and urethral 26 a combination of rectal urethral, and intravesical 3 rectal and intravesical 2 urethral and intravesical—in all 99 received rectal treatments, 83 urethral and 31 intravesical

RESULTS

In studying the results of radium treatment of carcinoma of the prostate we find that they naturally fall into four groups (1) *Symptomatic and functional* where the frequency dysuria, hæmaturia, dribbling and the size and force of the stream have improved or returned to normal (2) *local* where there is a change in the size and consistence of the prostate and seminal vesicles (3) *good* results or lasting results after 4 years of complete subsidence of all the symptoms, and where the prostate and seminal vesicles no longer present the characteristics of malignancy but are soft and elastic (4) those cases which showed *no relief* of symptoms and no actual change in the prostate and seminal vesicles.

SYMPTOMATIC AND FUNCTIONAL

Symptomatically the results from radium have been most remarkable. Seventy-seven per cent of the cases show a relief of some or all of the symptoms Patients who have been suffering from marked frequency occurring every 10 to 60 minutes day and night, others who have hesitancy and pace the floor only to void very small amounts of bloody urine with a much diminished stream and still others who have constant pain in the back and thighs, have been completely relieved Striking are the results in those cases who have had a suprapubic cystostomy for relief of complete obstruction when after a series of

gain weight and strength after a course of treatment

Hæmaturia. Blood in the urine was present in 17 per cent of the cases This was due to the extension of the tumor through the bladder or urethra Radium applied to these surfaces

cases responded within a week or 10 days or after two to four treatments

No 4977 was a patient aged 68 who had hæmaturia for 6 months The bleeding was present at each urination but varied its appearance, occurring sometimes at the beginning and sometimes at the ending of urination Rectal examination proved the cancer to involve the

although he received a total of 2900 milligram hours of radium He never had a recurrence of blood in the urine

Complete retention Complete obstruction to urination was noted in 17 cases (Several of these cases were able to pass a few drops of urine, perhaps an ounce in 24 hours) They were being catheterized regularly by themselves or by physicians Catheterization was painful in most of the cases as they had a marked cystitis together with urethritis The urethra in these cases is unlike that seen in benign prostatic hypertrophy cases in which the urethræ are encroached upon by large soft, and elastic lobes, causing potentially enlarged urethræ, while in the carcinoma cases the caliber of the urethræ is smaller than normal. It is firm and rigid due to the infiltration of the suburethral tissues by the tumor Radium in these cases has produced remarkable results Fifteen of them began to void after twelve or fourteen treatments. Seven were completely relieved of residual urine, while 8 showed a diminution which varied from 10 to 50 cubic centimeters Two were unable to void after 2100 milligram hours. These two were obstructed due to benign median lobes. Where there is much hypertrophy, the result of radium on obstruction and residual is not so pronounced.

No 5443 was admitted with complete retention He

was obscured by adhesions and by the low position of the prostate which was invaded by the tumor There were no enlarged glands felt The rectum was smooth and moved freely over it. Radium was applied, 600 milligram hours to the rectum 600 milligram hours in the [illegible] In a period treatment the end of the series, patient was voiding all his urine. Urinations occurred every 3 to 4 hours without hesitancy urgency or dysuria The size and force of the stream was almost normal. Rectal examination at this time showed great reduction in the area of induration in both the prostate and seminal vesicles, and one would not recognize the condition as one of carcinoma. The patient s urinary condition returned to normal and remained normal for 4 years. His general condition improved and he gained 15 pounds in weight. Patient has not been examined for 2 years but replies to questionnaire that he voids every 3 to 4 hours without difficulty

Still more remarkable are those cases which have had a suprapubic cystostomy for complete retention. Radium applied in these cases produces a restoration of urination through the urethra with a good sized stream and complete control together with healing of the suprapubic wound.

No. 7684 had a month previous to admission a suprapubic cystostomy for complete retention All the urine was draining through this wound After a series of radium treatment extending over a period of 6 weeks, the wound was entirely healed and the patient voided with a good-sized stream every 3 hours. No. 8271 had had 6 weeks [illegible] for complete obstruction esicles. o milli ms per atrons hours ved 25 erineal

400 per vesicam, the fistula closed and he voided freely through the urethra.

Residual urine Sixty-six cases had residual urine varying from 50 cubic centimeters to 700 cubic centimeters. About the third week of [illegible] and force of the stream were entirely relieved and were able to empty their bladders completely Thirteen per cent showed a diminished residual while 2 per cent did not show any change. No. 7521 had 400 cubic centimeters residual urine on admission. After 6 weeks of radium treatment, during which time 1400 milligram hours were given the residual urine had entirely disappeared and patient was voiding with ease. Since 60 per cent of the cancer cases had an infected urine, the relief of this residual adds greatly to the comfort of the patient and likewise removes the great possibility of a septic process supervening a malignancy

TABLE II —IMPROVEMENT IN SYMPTOMS

Before Treatment	Result of Treatment		
Symptoms	Percentage Present	Percentage Entirely Relieved	Percentage Improved	Percentage Unimproved
Frequency	96	57	25	18
Nycturia	93	57	25	18
Dysuria	80	90	—	10
Hæmaturia.	17	100	—	—
Hesitancy	65	80	7	13
Dribbling	76	75	5	20
Small stream	87	74	6	20
Complete retention	21	95	—	5
Residual urine	61	85	12	3
Pain in back	28	60 7	—	39 3
Pain in extremities	22	59	—	41
Loss of weight	14	57 1	—	42 9

Hesitancy Delay in starting the urinary stream was noted in 65 cases. In 80 per cent of these it cleared up completely, 7 per cent were improved, and 13 per cent remained uninfluenced by the radium rays.

Dribbling Seventy-six patients gave a history of dribbling of the urine either at the beginning during or at the end of urination. In 75 per cent of these this symptom entirely subsided while 5 per cent were improved and 20 per cent remained unaffected.

Size and force of stream. There was a larger percentage of cases who showed an impairment in the size and force of the urinary stream While many of these patients had dribbling there were some who had only a diminished size of stream and voided with little force. The statistics show that 87 per cent voided with much diminished size and force of stream The effect of radium is practically the same as that on dribbling (75 per cent relief) The relief of this symptom is one of the earliest signs of improve

ment. Usually after 10 to 12 treatments, there is a notable difference with regard to the ease with which the stream starts and the force with which it flows. Both improve gradually the maximum time limit for improvement being about 6 to 8 weeks after the termination of the treatment.

Frequency and nycturia Frequency is one of the first symptoms to appear in cancer of the prostate It was the most common symptom to be noted in the 100 histories. Frequency and nycturia were present in 96 per cent and 95 per cent respectively There are of course, many

10 minutes. Fifty-seven per cent of the cases were cured of this frequency In this group are classed all those patients who after treatment voided not oftener than every 4 hours during the day and who were able to retain urine at night 8 hours without discomfort. Twenty five per cent were improved so that they voided not more frequently than every 2 to 3 hours during the day and

continued to improve, while others did not show any improvement until after the series had ended. This can be explained from our study of sections of prostates which have been removed at opera

chyma, and then there is a gradual change to fibrosis and a disappearance of the cancer cells. When the fibrous change begins, there is a shrinking of the tissues with the result of diminished pressure on the urethra and internal vesical orifice. We have noticed in a few cases an increase of frequency for a few days at the beginning of treatment and occasionally complete obstruction for a few days. This period of exaggeration of symptoms corresponds to the oedematous stage of the tissues.

No. 6759 was admitted with frequency every 30 to 60 minutes day and night. The patient received 1300 milligram hours per rectum and 300 per urethram Three months after beginning of the treatment he was able to retain urine for 6 to 10 hours and voided with a normal-sized stream

Dysuria Pain in the form of strangury was generally relieved after a few treatments. Burning and smarting in the posterior urethra and neck of the bladder also were greatly ameliorated Eighty per cent of the cases complained of painful urinations Ninety per cent of these were free from pain after the first series The 10 per cent who failed to respond all received small amounts of radium, less than 1200 milligram hours The dysuria usually subsided when the size of the stream increased Some of the cases were very much improved after five treatments It is impossible to explain so early a result due to radium It is feasible, however to believe that passage of cystoscope or the radium applicator might cause a dilatation of the urethra and the improvement of the act of

tissues.

No 6759 complained of severe burning, hesitancy, dysuria, dribbling and frequency of every hour day and

Pain in the back and extremities Dull aching pain in the small of the back was noted in 28 per cent of the cases This pain was present day and night, regardless of position It never radiated to the shoulders it either was stationary or was referred down the thighs especially on the outer side. Sixty and seven-tenths per cent of these cases reported an entire relief of the pain. The remainder were very little, if any improved. X rays were taken of most of the cases About 65 per cent of the patients who complained of pain in the back showed metastases The fact that metastases were present did not appear to influence the effect of radium locally

the day and every four hours at night

In most cases pains in the extremities were described as an aching sensation, weakness, like a hot iron passing over the thighs and like

TABLE III.—CASES RECEIVING ONLY 1 SERIES OF RADIUM

No.	Milligram Hour	Frequency	Duration of Series	Symptoms Improved	Local Improvement	Irritation
1	1000	2-d	3-w	+	+	–
2	550	2-d	2-w	–	–	–
3	800	3-d	2-w	+	+	+
4	1050	2-d	4-w	++	–	–
5	1200	2-d	3-w	–	–	–
6	1100	2-d	3-w	–	–	–
7	1100	3-d	4-w	+	–	–
8	1300	2-d	4-w	++	–	–
9	800	3-d	4-w	+	–	–
10	2600	2-d	7-w	+++	+++	+
11	500	2-d	10-d	–	–	–
12	1000	3-d	4-w	–	–	–
13	600	2-d	3-w	–	–	–
14	600	2-d	10-d	–	–	–
15	600	2-d	2-w	–	–	–
16	850	3-d	4-w	–	–	–
17	250	3-d	10-d	–	–	–
18	800	3-d	3-w	+	–	–
19	400	2-d	1-w	–	–	–
20	800	3-d	3-w	–	–	–
21	1300	3-d	6-w	–	–	–
22	1600	3-d	7-w	++	+	–
23	1400	2-d	4-w	–	–	–
24	1900	3-d	8-w	+++	–	+
25	450	3-d	2-w	–	–	–
26	700	7-d	4-w	+	–	–
27	420	1-d	1-d	–	–	–
28	400	2-d	2-d	–	–	–
29	200	1-d	1-d	–	–	–
30	1050	7-d	6-w	+	+	–
31	400	5-d	2-w	+	–	–
32	700	14-d	6-w	+	–	–
33	865	14-d	4-w	–	–	–
34	200	1-d	1-d	–	–	–
35	1700	6-d	8-w	+++	++	–
36	1300	2-d	6-w	++	–	–
37	1525	4-d	6-w	++	–	–
38	2050	3-d	7-w	+++	++	–
39	700	3-d	3-w	+	–	–
40	1850	2-d	8-w	–	+	–
41	2500	2-d	8-w	++	++	+
42	309	1-d	1-d	–	–	–
43	400	2-d	8-d	+	–	–
44	420	7-d	4-w	+	–	–
45	330	7-d	1-w	–	–	–
46	1800	3-d	7-w	++	+	+
47	1200	2-d	4-w	+	–	+
48	2100	3-d	8-w	+++	++	+
49	1315	2-d	4-w	++	+	–
50	1625	14-d	9-w	++	+	–
51	1445	3-d	6-w	++	–	–
52	1500	3-d	6-w	–	–	+
53	2975	3-d	8-w	+++	++	–
54	2100	3-d	8-w	++	++	–
55	1000	3-d	4-w	+	–	+
56	600	2-d	2-w	–	–	–
57	900	3-d	4-w	+	–	+
58	2800	3-d	7-w	+++	+++	+
59	800	3-d	3-w	+	–	–
60	400	2-d	1-w	–	–	–
61	700	3-d	2-w	+	–	–

TABLE III —*Continued*

No	Milligram Hours	Frequency	Duration of Series	Symptoms Improved	Local Improvement	Irritation
62	900	2-d	3-w	+	–	–
63	700	3-d	3-w	–	–	–
64	1000	3-d	4-w	+	–	–
65	1200	4-d	7-w	+	–	–
65				39	16	11
65	1045	3-d	4-w	60%	23%	17%

NOTE d=day
2-d=treatments given every 2 days.
3-d and 4-d=treatments given every 3 and 4 days.

flesh being pulled from the bones. They were mostly referred to the outer side but rarely to the inner side of the thighs always to the muscles and never to the joints. Extremity pains were present in 22 per cent of the cases. Fifty nine per cent of these responded to treatment while 41 per cent showed no improvement. The improvement is probably due to resorption of the infiltration which involved nerves in the lower pelvis.

Loss of weight Fourteen patients complained of loss of weight, ranging from 10 to 50 pounds Most of the patients were professional men and sought relief before the picture of cancer was implanted on their external features, so that the marked anæmia, emaciation and cachexia were rarely seen. The general health of most of the patients improved after radium treatment. Appetite returned to normal and the general physical condition became distinctly elevated. Four teen of the cases gained weight varying from 8 to 25 pounds. The feeling of betterment usually began about the second week and continued depending on the symptomatic result. Some patients continued to lose weight and strength especially those who were in the later stages of the disease with signs of metastases in groins or elsewhere

LOCAL RESULTS

The local result of radium on prostatic cancer is expressed by a change in the consistence and diminution in the size of the prostate and seminal vesicles. While the local results are not so remarkable as the symptomatic, the examining finger detects a most gratifying condition. Since the evolution of treatments has undergone many changes in technique, one would expect a variation of results which is readily borne out in the tabulations.

In 55 of the 100 cases a marked change in the size and consistence was demonstrated. The hard stony-like character was changed to a much less indurated tissue with a definite elasticity. The prostate itself became normal in size and the vesicles smaller and movable. The hard plateau gradually disappeared, leaving a sensation of a chronic inflammatory condition. The hard nodules when present in these cases melted away. The palpable glands along the side of the pelvis became indistinct and non-palpable.

TABLE IV.—SIXTY FIVE CASES RECEIVING ONLY 1 SERIES OF TREATMENTS

No. Cases	Symptoms	Size of Prostate	Average Milligram Hours	Per centage Improved	Per centage not Improved
26	no response	no change	635	0	100
39	improved	no change	999	60	40
18	improved	decreased	1415	23	77

No. 5818 showed on admission a very large, adherent, irregular nodular, stony-hard prostate with the process extending upward and involving the seminal vesicles. There was also a definite fixation of the prostate with the formation of an intervesicular plateau. The patient received in 2 months 2300 milligram hours per rectum and 400 per urethram, making a total of 2800 milligram hours. At the end of the series the prostate was normal in size, adherent, and chronically inflamed. There was nothing to suggest malignancy. The stony character had entirely disappeared. fixation of the structures was replaced by a definite degree of mobility. Some of the cases showed a subsidence of the hard character without a diminution in the size of the mass.

A number of these cases were operated upon and found to be benign hypertrophies coexistent with carcinoma. The radium usually affected the cancer tissue, but failed to produce any marked change in the benign hypertrophy.

The cases showing local result were given 1000 to 6225 milligram hours of radium. One to five series were administered over a period of 6 weeks to 2 years. Thirty-one cases received only one series of treatment and averaged 2300 milligram hours. Eleven received 2 series averaging 2500 milligram hours. 6 received 3 series averaging 2900 milligram hours, 5 received 4 series, averaging 3000 milligram hours, and 2 cases received 5 series, 5227 milligram hours and 6225 milligram hours respectively. Many of these treatments were given 1 to 3 days apart with an interval of several months between series. Doubtless much better results might have been obtained had the more recent technique of treatment that is now in vogue been carried out.

The changes in the tissue occur usually about the third to the fifth week. This change can be detected shortly after the onset of symptomatic improvement. Cases vary to some degree on this point but as a rule it can be detected near the end of the first series. Cases which had seminal vesicle involvement showed similar changes, provided radium was directed over them. It was formerly thought difficult to obtain changes in the vesicles, but it is now known that the treatments were not accurately given in these regions. A great deal can be accomplished by placing the radium intravesically over the seminal vesicles as well as high up in the rectum.

Tables III and IV show result in those cases receiving a single series of treatments. It will be readily seen that those cases which showed no response to radium received the smallest amount, while those which showed a symptomatic improvement received a larger amount and those which showed local effect or a change in the size of the tumor received a still larger amount. It is apparent that more radium is required to produce a demonstrable change in the carcinoma than to affect the symptomatology. Table IV does not indicate the degree of improvement of the symptoms and change in the prostate for none of them received enough radium to produce a complete subsidence of all the symptoms or complete resorption of the cancer tissue.

Table IX shows that the greater the number of series the greater was the percentage of local improvement. The average amount of radium was progressive as the series advanced and it was not until 3000 milligram hours were given that the cases showed a 100 per cent symptomatic and local improvement. This amount does not necessarily mean that these patients have been cured, as different patients react differently and no two show the same status of cancer involvement. All cases receiving this amount showed some degree of improvement in symptomatic and in the local condition.

FIVE CASES SHOWING GOOD RESULTS

There were a few cases which apparently responded to radium in a remarkable manner. The immediate results were excellent. They were entirely free from symptoms and rectal examination showed regression of the tumor so that the prostate was normal in size. These patients have enjoyed apparently perfect health for 4 years two have had a recurrence of symptoms and three remain perfectly well after this interval. The amount of radiation has been large in all these cases.

TABLE V.—CASES RECEIVING 2 SERIES OF RADIUM

No	First Series		Interval	Second Series		Total		Results		
	Milligram Hours	Duration		Milligram Hours	Duration	Milligram Hours	Duration	Symptoms	Local	Irritation
1	2000	4–w	4–w	780	1–w	2780	2 5–m	+++	++	+ sl.
2	2600	5–w	12–w	2000	10–w	4600	6 –m	+++	+++	+ sl.
3	1050	4–w	2–w	675	1–w	1725	2 –m	–	–	–
4	2100	3–w	12–w	500	4–d	2600	4 –m	+++	++	+ sl.
5	750	3–w	2–w	900	2–w	1650	2 –m	+++	+	–
6	700	2–w	4–w	800	2–w	1500	2 –m	+	+	–
7	600	2–w	4–w	800	2–w	1400	2 –m	++	–	–
8	600	2–w	8–w	800	2–w	1400	3 –m	+	+	+
9	900	3–w	12–w	1200	4–w	2100	3 –m	–	–	–
10	300	3–d	12–w	500	5–d	800	3 –m	++	–	–
11	500	1–w	26–w	250	1–d	750	6 5–m	–	–	–
12	1200	3–w	12–w	700	2–w	1900	4 5–m	+	–	–
13	1600	3–w	8–w	500	10–d	2100	3 –m	+++	+	–
14	1000	3–w	12–w	500	5–d	1500	4 –m	++	+	–
15	900	3–w	12–w	500	2–w	1400	5 –m	–	–	–
16	1200	5–m	20–w	600	8–w	1800	12 –m	–	–	–
17	3070	5–m	16–w	2200	8–w	5270	10 –m	+++	+++	–
18	450	3–w	8–w	450	1–w	900	3 5–m	–	–	–
Averages	1248	4 4–w	10–w	786	2–w	2065	4 3–m	66 6	30 0	22 2

d = day w = week. m = month. sl. = slight.

TABLE VI.—CASES RECEIVING 3 SERIES OF RADIUM

No.	First Series		Interval	Second Series		Interval	Third Series		Total		Results		
	Milligram Hours	Duration		Milligram Hours	Duration		Milligram Hours	Duration	Milligram Hours	Duration	Symptoms	Local	Irritation
1	1200	3–w	5–w	400	2–w	7–w	500	4–w	2100	5–m	+++	+++	–
2	2160	6–w	6–w	885	1–w	3–w	265	1–d	3290	5–m	+++	+	+
3	725	2–w	10–d	1115	3–w	3–w	920	3–d	2760	3–m	+++	+++	+
4	1400	4–w	10–w	300	1–w	3–m	500	1–d	2200	7–m	++	–	+
5	1300	4–w	1–w	750	3–w	7–w	675	2–w	2725	4–m	+	++	–
6	1200	6–w	5–w	400	2–w	9–w	400	3–w	2000	6–m	–	+	–
7	800	12–d	4–w	600	8–d	6–m	600	10–d	2000	8–m	–	+	+
8	1800	4–w	6–w	900	3–w	6–w	400	8–d	3100	5–m	+	++	+
9	400	3–w	2–w	700	6–w	2–w	600	4–w	1700	5–m	–	+	–
10	1450	2–w	6–w	1100	3–w	4–m	400	3–d	3130	7–m	++	–	–
	1243	3 6–w	4 7–w	735	2 5–w	9 1–w	536	1 7–w	2503	5 6–m	70%	70%	50%

symptom. Six weeks before entry to the hospital complete retention occurred. On admission rectal examination showed a markedly enlarged prostate. It was smooth and elastic, although the impression given was that of an underlying markedly indurated posterior lobe which was malignant. The outlines of the prostate could not be distinctly made out. The mass extended well up on the left to the left wall of the pelvis and was densely indurated and adherent. The right lobe of the prostate was not so markedly enlarged. The right seminal vesicle was invaded in its lower portion, densely indurated and adherent. Along the outer portion of the left lobe there was a hard nodular area. The membranous urethra was involved in a mass of marked induration. The lower portion of the prostate and that part extending up over the left lobe was practically of stony hardness. The bladder wall above the upper confines of the prostate was soft and yielding. He was treated by retention catheter

hours per urethram which caused a temporary obstruction. Rectal examination at the end of 8 weeks showed the mucosa of the rectum to be only slightly thickened.

TABLE VII —CASES RECEIVING 4 SERIES OF RADIUM

No	First Series		Interval	Second Series		Interval	Third Series		Interval	Fourth Series		Total		Results		
	Milligram Hrs	Duration		Milligram Hours	Duration		Milligram Hours	Duration		Milligram Hours	Duration	Milligram Hours	Duration	Symptoms	Local	Irritation
1	875	2–w	7–w	350	1–d	6–w	1135	10–d	3 5–yr	700	1–w	3160	3½–y	++	+++	–
2	1460	4 w	3–w	700	2–w	2–w	960	4–w	2–m	800	2–d	3320	9–m	+++	+++	+
3	980	2–w	2–w	325	5–d	5–w	500	10–d	2–m	1100	3 w	2905	5–m	+++	+++	–
4	700	2–w	13–w	600	10–d	6–m	600	10–d	14–m	1800	6–w	3700	2–yr	+++	++	+
5	700	2–w	5–m	300	5–d	4–m	600	2–w	12–m	500	8–d	2100	22–m	+++	++	+ sl
	943	2.5–w	9–w	455	5 6–d	3 5–m	759	2–w	15–m	860	2 2–w	3037	20–m	100%	100%	60%

TABLE VIII.—CASES RECEIVING 5 SERIES OF RADIUM

No.	First Series		Interval	Second Series		Interval	Third Series		Interval	Fourth Series		Interval	Fifth Series		Total		Results		
	Mg Hr	Duration		Mg Hr	Duration		Mg Hr	Duration		Mg Hr	Duration		Mg Hr	Duration	Mg Hr	Duration	Symptoms	Local	Irritation
1	1100	4–w	3–w	1400	5–w	6–w	900	4–w	4–w	1550	4–w	6–w	1275	3–w	6225	8 5–m	+++	+++	+
2	1100	2–w	11 m	500	1–w	4–m	700	1–w	3–m	400	4–d	4–m	000	2–w	3200	24–m	+++	++	+
	1100	3–w	6–m	850	3–w	2 7 m	800	2 5 m	2 m	975	2 5 w	2 7 m	35	2 5–w	4712	16–m	100%	100%	100%

The prostate was very little larger than normal The consistence was rather elastic and would impress one, feeling it for the first time, as a moderate grade of benign prostatic hypertrophy The right lobe was a little more indurated than normal, particularly on the periphery Otherwise, the consistence of the prostate showed nothing which indicated malignancy The seminal vesicles were just palpable they were soft and elastic. During the next year the patient gained 17 pounds and general health improved Urinations took place every 3 or 4 hours. Four years later patient reported that he had begun to use catheter occasionally voided every 2 to 3 hours, and had lost considerable weight and strength Patient was examined at end of 3 years but not since At that time there was no evidence of recurrence of the cancer

No. 4726 had complete retention on admission to the hospital and after a course of radium enjoyed 4 years of perfect health, after which he had a recurrence of urinary symptoms He was first admitted to the hospital on November 18 1915 His history dated over a period of 1 year. He complained of frequency and hesitancy Two weeks before entry to hospital he developed complete retention. Rectal examination showed prostate to be

ternally no nodules, and no marked tenderness The induration of the prostate did not extend into the membranous urethra. The left seminal vesicle was slightly thickened, drawn outward, a little corded, and moderately indurated One or two glands were palpable far out along the lateral wall of the pelvis Between the two seminal vesicles the intervesicular space was soft, no indurated cords or glands Rectum was negative. Cystoscopic examination showed slight intravesical hypertrophy of the right and left lobes of the prostate The median

20 pounds in weight Urinations occurred every 2½ hours during the day and night without any difficulty

than the right but of the same consistence. Six months after the beginning of the treatment, the prostate was found to be slightly broader than normal, but there was no area in the prostate or vesicles characteristic of malignancy

to be quite prominent, moderately enlarged, surface slightly irregular extremely hard Induration extended up on each side and involved the lower portion of the

TABLE IX.—SUMMARY OF TABLES III, V VI, VII, AND VIII SHOWING RELATION OF AMOUNT OF RADIUM TO DEGREE OF IMPROVEMENT

No of Series	No of Cases	Average Milligram Hours	Duration	Symptomatic Improvement					Local Improvement				
				Total Per centage	Percentage Degree				Total Per centage	Percentage Degree			
					+++	++	+	0		+++	++	+	0
1	65	1045	4–w	60 0	10 7	18 0	13 3	40 0	23 0	3 0	7 7	12 3	77 0
2	18	2065	4 3–m	66 6	33 3	16 6	16 6	33 3	47 6	11 1	11 1	27 4	52 4
3	10	2503	3 6–m	70 0	30 0	20 0	20 0	30 0	70 0	20 0	30 0	20 0	30 0
4	5	3037	20–m	100 0	80 0	20 0	0	0	100 0	60 0	40 0	0	0
5	2	5628	16–m	100 0	100 0	0	0	0	100 0	50 0	50 0	0	0

NOTE +++=complete subsidence of all symptoms or complete resorption of the tumor
++=moderate change.
+=slight change.

TABLE X.—CASES RECEIVING 1 SERIES OF TREATMENTS

Result	No. Cases	Average Milligram Hours
No response	23	625
Symptomatic alone	20	999
Symptomatic and local improvement	22	1415

NOTE Symptomatic improvement was not complete in many of these cases, nor was there complete resorption of the cancer tissue.

TABLE XI.—EFFECT OF RADIUM ON LONGEVITY

Number of Cases		Average length of life after onset of symptoms
Now dead	48	2 54 years
Not improving	13	3 60 years
Improving	12	4 40 years
Good	5	6 00 years
Unheard from	22	

(Radium treatments were begun in all cases from 1 to 2 years after onset of symptoms)

seminal vesicles and formed a definite intervesicular plateau. There were no enlarged glands felt and the rectum was perfectly smooth

This patient received only 2635 milligram hours of radium. Had he received over 4000 in a shorter period, say 8 weeks to 2 months he might have been cured.

No. 5193 was admitted June 14, 1916 complaining of frequency of urination and difficulty in starting the stream. Three years previously he began to urinate every 2 hours day and night Frequency increased to every hour associati
ation.
vesicles
itself w
promine
shallow
durated, moderately adherent and fixed. The left lobe was much more prominent and much more indurated and larger than the right, extending well downward toward the perineum and pelvic wall. Outer edge was quite sharp and hard. The right seminal vesicle was about the size of the finger smoot
extended upward and
came gradually smaller
The left seminal vesicl
irregular nodular, extremely fixed, very hard induration
back, almost to the
e felt in the sacral
ious urethra was ex
wn to the triangular
was not much en-

not show any demonstrable lesion. In three months 3200 milligram hours of radium were given, 2500 milligram hours per rectum and 700 milligram hours per urethram. At the end of this treatment rectal examination showed the rectum to be a little thickened but not ulcerated The prostate was about normal size, fairly smooth, and a little firmer than normal. On pressure it seemed distinctly atrophic and thinner than usual. The indurated right seminal vesicle had improved immensely was still a little firmer than normal and distinctly adherent along the outer edge but one would not recognise it as being malignant. The left seminal vesicle was drawn outward, slightly indurated, considerably adherent, and possibly one or two small glands were felt far out, but this vesicle would not be recognized at all as malignant. The membranous urethra was a little broader than normal and somewhat indurated and fixed.

[illegible]

Recent report by his family physician states that there has been no change in the prostatic tissues for the past 4 years.

This splendid result was obtained with 3200 milligram hours in one series.

TABLE XII.—EIGHTEEN CASES TREATED RECENTLY (NOT INCLUDED IN THE 100 CASES)

No.	Age	Frequency of Treatment	Radium							Results	
			Urethral	Vesical	Rectal	Interglandular (Needle)	Total	Duration	Irritation	Symptoms	Local
1	69	2-d	600	700	1300		2600	6-w	slight	++	++
2	65	1-d	1000	400	1500		2900	6-w	none	+++	++
3	67	1-d	400	400	1000		1800	4 w	slight	++	+
4	73	1-d	300	400	1800	500	3200	6-w	none	+++	+++
5	78	1-d	800	900	2300		4000	6-w	slight	+++	+++
6	62	1-d	500	400	1000		1900	7 w	none	++	
7	63	1-d	800	300	1300		2400	5 w	none	++	+
8	72	1-d	900		2100	500	3500	7-w	none	++	+++
9	80	1-d	500	400	1800		2700	7-w	none	++	++
10	68	1-d	500	400	1900		2800	5-w	none	+++	++
11	71	1-d	1 00	800	2100	500	4500	6-w	slight	+++	+++
12	65	1-d	700	500	2700	500	4400	6-w	slight	+++	+++
13	64	1-d	900	500	2300	1000	4700	6-w	slight	+++	+++
14	68	-d	900	400	2700	500	4500	6-w	slight	+++	+++
15	71	-d	400	500	2300	1000	4200	6-w	slight	+++	+++
16	66	-d	1100	900	2000	1000	5000	8-w	slight	+++	+++
17	62	1-d	800	800	2400	1000	5000	7-w	slight	+++	+++
18	69	1-d	500	600	3100	500	4700	7-w	slight	+++	+++

urgency and difficulty in starting the stream were present but he had never had hematuria

vesically enlarged The mucous membrane was everywhere smooth The bladder was considerably trabecu-

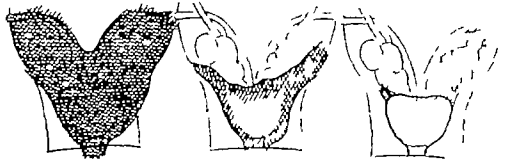


Fig 1 Case 12 Chart showing involvement on admission, April 27 1921, after treatment consisting of 1500 milligram hours, May 24, 1921 and after 4400 milligram hours, June 21 1921

little rectal irritation. He would leave the ward to go to an afternoon matinee and return without any urinary discomfort
of the
There
ination
tatic orifice showed considerable edema. Left lateral margin was negative. Just behind it was a small necrotic mass. With finger in rectum and cystoscope in urethra, trigone did not seem to be thickened, as it is in cases which have definite carcinoma of the prostate. There was no infiltration of the suburethral tissues. Died, at home, of pneumonia 1 month later Necropsy not permitted.

any hematuria

particularly indurated. The membranous urethra was soft, as was also the apex of the prostate. The growth seemed to lie between the seminal vesicles involving the posterior portion of the prostate.

Cystoscopy The instrument was readily introduced and found 50 cubic centimeters residual urine. The bladder showed evidence of obstruction. The walls were trabeculated and there were a number of cellules. The

tween the instrument and the finger

The patient received three series of radium treatments

left side.

On May 23 patient returned for second series of treatments. Rectal examination showed prostate considerably larger than normal, somewhat irregular, definitely softer than before the radium treatment. The left lobe was only slightly larger than normal. There was a hard area

were given per rectum and 100 per urethram.

Patient received third series of radium treatments in September of that year at which time he was given 10 hours of radium of 100 milligrams each,—800 per rectum and 800 per urethram. Patient showed moderate rectal irritation, which lasted for 4 weeks only Urinations remained normal Rectal examination in November showed very little change in the rectal mucosa and no ulceration. The prostate was a little larger than normal irregular compressible, and adherent.

Two years later the patient was again examined. Symptomatically he had been free from frequency and pain. Residual urine was 15 cubic centimeters. There was a slight stricture of the urethra which was easily dilated Rectal examination showed the prostate broader than normal and the vesicles broad and adherent, but neither
inkedly adherent.
It would have
arcinoma at this

every 10 minutes, but could hold urine for 5 or 6 hours. He slept well and was doing his usual work. Prostate was a little broader than normal, moderately indurated and slightly adherent. Above the prostate was a plateau which extended across the pelvic cavity more prominent on the left side. In the mid-line there was a small area simulating an excoriated area. The patient was given 1100 milligram hours of radium per rectum over the seminal vesical regions with the result that there was resorption of the indurated areas.

bladder"

This is a case which apparently could not endure the concentrated form of treatment. The

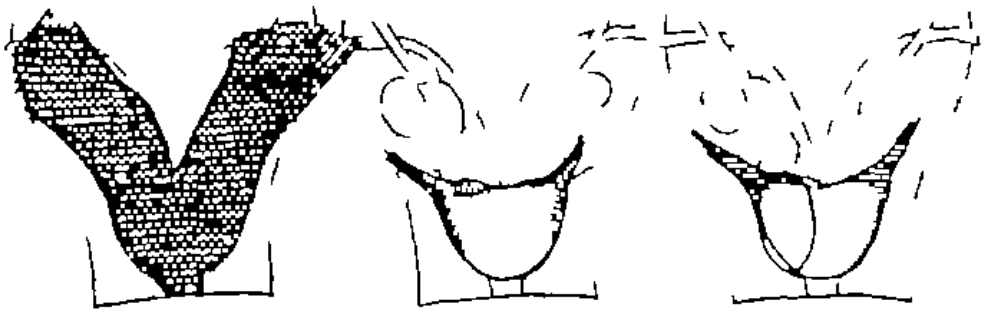


Fig 2 Case 15 Chart showing involvement on admission, April 21 1921 after 2700 milligram hours, June 6, 1921 and after 4200 milligram hours, June 15 1921

patient received 3100 milligram hours in four series The result has thus far been most encouraging

TWENTY THREE CASES WITH NO RELIEF OF SYMPTOMS

In contrast with symptomatic, local, and good results, a certain number of cases failed to respond to radium treatment Many of these received small doses, too small to produce any definite action on the carcinoma, while others received 1200 to 1400 milligram hours and should have shown at least a change in symptomatic condition Such was not the case None of these cases showed any ill effect from the radium, and there was no reason why treatment should not have been continued as far as the charts indicate, except that in a few instances patients left the hospital of their own accord. Twenty-three cases did not react to radium. A further study of these cases showed that the average amount of radium given was only 625 milligram hours, while the average for those receiving at least some improvement was 1415 milligram hours.

There was only one case which showed local results without symptomatic. This case proved to be one with well-developed growth along the urethra. He had received 1400 milligram hours of radium, all given per rectum. Had he been given extensive treatment to the urethra and internal vesical orifice symptomatic results would almost undoubtedly have been obtained. In no case did we find that radium stimulated the growth of the cancer It is, therefore quite clear that those who did not show any relief of symptoms did not receive radium enough, while the next grade obtained a symptomatic improvement, and when still more radium was given, local results were obtained

IRRITATION FROM RADIUM

The irritation from radium rays has been one factor for consideration in this therapy It was not until after this analysis had been completed that we were able to combat the main objection to radium treatment. Twenty-eight cases showed more or less local discomfort. Some were very slight, while others were severe However all are included in this series so as to definitely determine the factors involved. There were no general systemic reactions such as nausea, vomiting chills, fever etc. All symptoms of irritation were localized and manifested by rectal and urethral burning urgency for stool passage of mucus and occasionally blood per rectum, and in two cases ulceration of the rectal mucosa.

Rectal. Irritation of the rectum in the form of an aching smarting and burning sensation was noted in all of the 28 cases. In 9 cases it was very slight and hardly worth mentioning it lasted for a few days and caused no change in the patient s daily routine of affairs. In other cases the irritation became intolerable Especially was this noted on evacuation of the bowels or when fecal matter reached the rectal area treated The patient would then ask for an enema or opium suppository or both. The rectal irritation began at about the tenth treatment and often lasted for 2 or 3 weeks after the series had ended. The more severe cases would complain of some pain as long as 6 months afterward

of burning and smarting, or during the latter part of the series. Usually it was an indication to dispense with the treatment. Some cases were treated until they could not tolerate the applicator in the rectum Those cases receiving large doses at one sitting or frequent treatments in the same area were first to show evidence of irritation. In some of the severer cases frequent bowel movements accompanied with mucus or evacuations of mucus alone were demonstrable. Never were there over eight to ten movements in 24 hours in the most severe cases, but there was

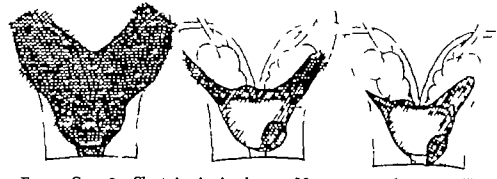


Fig 3 Case 18 Chart showing involvement May 10 1921 after 3200 milligram hours' treatment, June 7 1921 and after 4700 milligram hours, June 22 1921

moderate tenesmus and straining at stool. In none of the cases was it permanent, in most cases it subsided after 3 weeks, but in two cases it persisted for 8 months Urgency for stool was present in 6 of the cases discharging mucus Blood-streaked mucus was noted in 4 cases only

Urethral Smarting and burning sensations were the main complaints in this region although complete retention occurred in 3 of the cases, 2 to 5 days following the first treatments. After 2 or 3 days of complete retention they began to void and in about one week the size and force of the stream gradually returned to much better quality Five of the cases complained of urethral irritation. These symptoms were never so prominent as the rectal distress nor were they as prolonged

Ulceration Only two cases developed ulceration of the rectal mucosa. One healed entirely in 10 months and the other developed a recto-urethral fistula 4 months after the treatment (recently 2 other cases of rectal ulceration have appeared) The latter case showed on admission a hard nodule in the center of the prostate with little involvement of the lower portions of the seminal vesicles. He received 2800 milligram hours of radium 200 of which were given in the rectum over or near the nodule The result was complete resorption of the mass and the development of ulceration The patient complained of considerable burning and tenesmus for 6 months He, however, suffered very little from the small fistula. He makes a statement 6 years afterward that he is doing as much work as ever and feels perfectly well except that he has in 24 hours three to four bowel movements a good part of which is composed of urine No fæcal material has ever passed the urethra. His urinations are not oftener than normal and he does not have to get up at night. He is apparently cured of the cancer, although he had never returned for further examination. These two cases occurred early in the use of radium. None of the last 150 cases have developed ulcerations. It is certain that they can be avoided and must be kept in mind when giving a large series of rectal treatments. Large urethral treatments will give rectal irritation as well as rectal treatments, and occasionally rectal treatments may cause a diminution in the size and force of the stream with exaggerated hesitancy, but this lasts only for a few days at most. If 150 to 200 milligram hours are given at one sitting in one place there is considerable smarting and burning in that area in 4 days which lasts for 3 weeks. Generally it may be stated that treatments exceeding 150 milligram hours in one place at one sitting or the same area treated oftener than once a week to 10 days will produce an irritation.

With the intensive treatment now used, no ulcerations have developed and the patient is able to tolerate 4000 milligram hours better than 2000 milligram hours given by the former method (2 recent cases may require us to modify this statement, H. H. Y.) Frequently a patient passes mucus and has from two to four stools a day with some discomfort or tenesmus but these symptoms finally disappear None have complained of constipation Needles introduced directly into the cancer through the perineum for a 500-milligram-hour treatment have not caused any irritation or discomfort of any sort.

There have been no general systemic reactions with malaise, nausea, vomiting or elevation of temperature. As a rule, the patients feel better and are able to tolerate a larger number of treatments if they are allowed the freedom of out-of-doors and are treated as ambulatory patients rather than if we house them in their rooms for 4 or 5 weeks. Hygienics play an important rôle in the treatment of malignant disease as well as in other diseases and should be kept in mind in the treatment of cancer of the prostate with radium.

MORTALITY

The expectancy of life of a patient with cancer of the prostate is a variable factor As a rule, prostatic cancer is a slowly developing malignancy In estimating the length of life of a patient from the beginning of the symptoms it is almost impossible to be accurate, for many have an extensive invasion of cancer before any urinary symptoms appear It seems however to be the only method which we have at our present command. The average length of life after beginning of symptoms for the 48 cases known to be dead is 2 54 years Twenty two patients were not heard from They failed to answer the second questionnaire, and a third sent to the family physician failed to elicit further details regarding them. The statistics show 13 cases who are not improving and have now lived an average of 3 6 years since onset of symptoms. Many of
and local
prostatic
in health due to metastases and al
patients still under treatment who are showing improvement. The average length of life in this group is 4 4 years.

Those cases which are considered as good results have now lived an average of 6 years since onset of symptoms. There are 5 cases in this group Table XI shows that, even where cure is impossible, treatment with radium tends to prolong life and that in a certain number of cases a cure may be expected.

We have no definite histological proof that radium is a cure for inoperable cancer of the prostate but we may draw valuable conclusions regarding its effect and in this way guide our methods of application of the γ rays in such a way that in the future it may yield a much higher percentage of good results There is no doubt that radium is as good a therapy as any that we have at our command that patients may be relieved of much pain and discomfort in their last years, even if a cure cannot be instituted in a majority of the cases Relief of symptoms is what the patient comes to us for just as he does in any other disease, and why

results can be obtained

Table XII shows the result in 18 cases receiving at the first series the more concentrated form of treatment. The results obtained are too recent to pronounce cures and sufficient time has not yet elapsed to allow the radium to produce its total effects symptomatically and locally but all cases except one show on discharge a very remarkable change in both consistency and size of the carcinoma. The detailed rectal findings together with the prostatic charts of three of the cases are given These are not exceptional cases, but are cases in which, when there are no bone metastases, the results are more uniform than heretofore obtained.

CASE 12 (Table XII) April 27 1921 rectal examin-

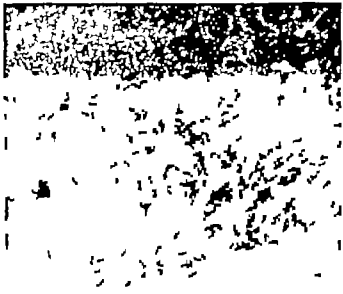


Fig 4 Scirrhus cancer of the prostate.



Fig 5. Adenocarcinoma of the prostate.

pain. There is no pain in back, hip or thighs. General condition has been fairly good. He simply returns for observation.

The anal sphincter is in good condition. Prostate is now a little broader than normal especially on the right side. Left lobe is about normal size and consistence and does not even now suggest carcinoma. Between the vesicles the tissues are quite soft. Examination causes

The whole prostate forms a transverse mass around the shaft of the instrument and the induration and enlargement beneath the urethra extends to the apex, In other words there is a suburethral thickening which extends practically to the apex of the prostate and which itself suggests malignancy Induration, however is not of stony hardness

June 6 1921 Patient has now had 18 treatments per rectum, 4 per urethram, and 5 by bladder a total of 27 treatments. During the past month his general condition has improved remarkably he has gained 5½ pounds in weight, appetite has improved and patient feels very much stronger Patient voids about every 3 hours, moderate sized stream with natural act of micturition, force of stream not quite normal. No headache, backache, or pain in the thighs Patient has had some rectal irritation, passes a small amount of mucus but never any blood. Patient has had some frequency of bowel movement about 7 or 8 a day but the rectal condition has now improved so that the bowels move only once or twice a day Patient considers himself remarkably improved

Rectal examination June 15 shows a prostate that is now normal in size and consistence, not nodular not indurated except slightly, not adherent. The change is really remarkable. Right seminal vesicle now feels only

From examination at present one would never suspect that this patient had carcinoma of the prostate and seminal vesicles.

CASE 18 (Table XII) MAY 10, 1921 Rectal examination shows anal sphincter good, somewhat spasmatic. Prostate is very irregular Left lateral lobe is somewhat nodular extremely indurated, fixed, induration almost of stony hardness and extending down along the membranous urethra but not palpable in the bulb external to the triangular ligament. Right lobe of the prostate is also irregular markedly indurated, extremely prominent as you go backward and the induration extends forward to the left lateral wall of the pelvis and obscures the seminal vesicles. This indurated mass makes it impossible to feel the left seminal vesicle. At the upper end, on both sides, there is a transverse plateau of marked irregular induration, which extends from one side of the pelvic wall to the other upward, as far as the finger can reach and beyond. Rectum also is everywhere smooth and on the left side it is freely movable upon the prostate and seminal vesicle. On the right side the musculature is invaded and rectum is fixed.

June 8 1921 Patient has had about 32 treatments. He complains only when he goes to stool, desire for which



Fig 6 Cellular or medullary cancer of the prostate

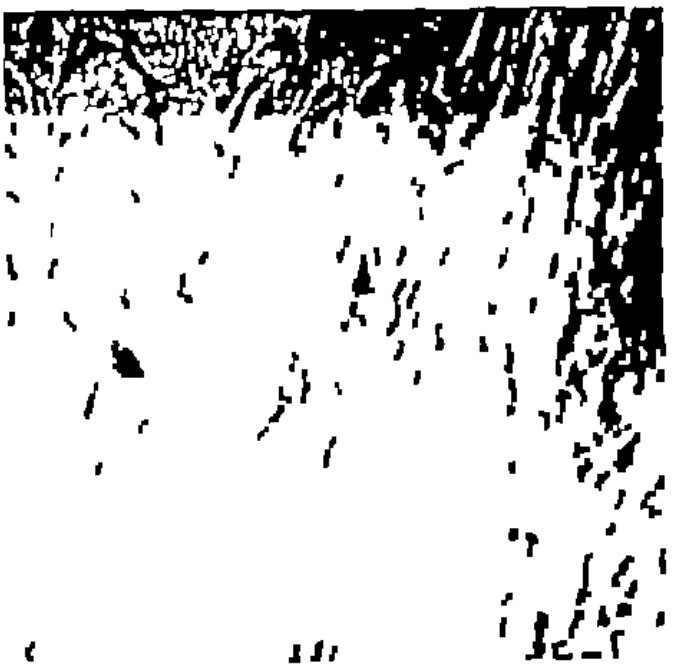


Fig 7 Adenocarcinoma showing complete destruction of the cancer with marked fibrosis following radium treatment

with needles through the perineum Treatment over the seminal vesicles and along the pel ic wall are also apparently incomplete.

Rectal examination, June 22 shows anal sphincter in good condition Rectal wall is everywhere smooth, it is not particularly tender and no areas of ulceration or ex

The cure of cancer of the prostate and seminal vesicles has thus far been a difficult problem. Surgery has failed except in a very few selected cases where the cancer is small and limited to the prostatic tissue. We attribute the failure to (1) the inaccessibility of the tumor (2) the late appearance of the case in the clinic, (3) cases with bony metastases, (4) improper technique and (5) insufficient radiation These difficulties are rare in surface cancer Since the action of radium varies inversely to the square of the distance, it is, therefore, necessary to apply the γ rays as near as possible to the tumor to obtain the maximum effect With this basic principle in mind and avoiding the severer irritations, we should be able to control cancer of the prostate in those cases which have not developed metastases beyond the seminal vesicles

Large doses of radium in the shortest possible time applied to all surfaces of the prostate, viz. per rectum, per urethram, and per vesicam apparently control the peripheral growth. Cases which have shown recurrence have done so in the mid-prostatic and vesical orifice and seminal vesical areas More careful technique has controlled all the areas except the mid-prostatic portion.

Intraglandular radiation with needles adds much to supplement the surface treatments Either treatment without the other is inadequate. If needles alone be used then the tips of the seminal vesicles escape radiation. Cases should be examined every 3 months to detect any area of recurrence so that further radiation may not be delayed If rigid technique with massive doses be used, we believe that cure of cancer of the prostate, provided there are no metastases beyond the seminal vesicles, lies within the scope of radium treatment.

CONCLUSIONS

1 Radium gave symptomatic relief and return of normal urination in 75 per cent of the cases.

2 Radium relieved the pain in the back in 50 per cent of cases suffering from metastases.

3 Irritation from radium can be avoided by treating widely remote areas in successive treatments and by alternating between rectal, urethral and vesical applications.

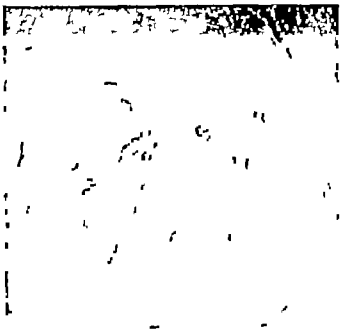


Fig. 8. Adenocarcinoma showing necrosis due to radium applied intraglandularly



Fig. 9. Adenocarcinoma showing variable effect of radium. One-half of the alveolus shows degenerative changes while the other half shows healthy cancer tissue —3 weeks after termination of radium series

4 At least 1000 milligram hours must be given to produce any symptomatic improvement.

5 Fourteen hundred milligram hours must be given to produce any perceptible change in the tumor mass

6 Three thousand milligram hours must be given to produce symptomatic and local results in the same patient.

7 Four thousand and 5000 milligram hours in a period of 6 to 8 weeks should be given if possible, in addition to needle treatments of 500 to 2000 milligram hours through the perineum.

8 Cases which did not respond to radium did not receive sufficient radiation.

9 Large doses must be given in as short a period as possible to produce maximum results

10 No general systemic reactions have been encountered.

11 Combined extraglandular and intragland ular radiations apparently give the most satisfac tory results.

12 Thus far we have no actual proof that radium has produced an actual cure for cancer of the prostate and seminal vesicles, although three cases remained free from symptoms and tumor growth for more than 4 years and many others show on rectal examination a condition of the prostate which does not now resemble cancer

II Results of Radium and Operation in Cancer of the Prostate (33 cases)

Radium and surgical methods have been used to give relief in some of the more difficult cases of cancer of the prostate and seminal vesicles. Herein lies a possibility which must not be over looked as better results may be obtained in a certain number of cases by a combination of radium and surgery Questions naturally arise Can we remove the cancerous tissue after it has been treated with radium and increase the opportunities for cure? Can we remove most of the malignancy and treat the remainder with radium? Do we spread the cancer by operative measures? Can we obtain better results by pre operative and postoperative application of the radium, or can we at the time of operation remove as much of the cancer as possible and then apply massive dose treatments?

The operative series is a small one consisting of 33 cases. Practically all the possibilities previously mentioned have been carried out It is certain that operative measures do not add to the risk of metastatic development. A series of 100 cases which were operated on without radium treatment lived almost as long as cases which were not operated on and which received radium treatment alone but there was no attempt to cure these cases.

This series of cases is similar to the series of 100 cases previously treated with radium alone Ages range from 58 to 80 the largest number of cases being found in the seventh decade. There were three cases under the sixtieth year twelve between 60 and 70 and six between 70 and 80.

The prostate was generally invaded in all the cases. Both seminal vesicles were involved in all except three and these showed an extensive infiltration in one vesicle. The average number of milligram hours given before operation was 1380, ranging from 400 to 4000. Treatments extended over a period of 1 week to 14 months. The symptomatic and functional improvements were not marked, being only 26 per cent. None of the patients were entirely relieved from all their symptoms. Thirty-eight and eight tenths per cent showed local improvement, but not complete resorption of the cancer.

The operations performed were of two types: (1) conservative perineal prostatectomy—by means of which the cancerous tissue about the prostatic urethra and vesical orifice was removed; (2) subtotal prostatectomy—by means of which the capsule of the prostate was removed together with the cancer. There were two operative series: one which received pre-operative radium treatment and another which received post operative radium treatment.

There were 28 cases which received radium before operation. These were treated per urethram and per rectum. 7 cases received rectal treatments alone and 20 received rectal and urethral treatments. The total radiation varied from 400 to 4000 milligram hours, the average radiation being 1600 milligram hours. Most of the cases were operated on at the end of the series of radium treatment by the conservative method. Nine cases received massive doses of radium at the time of operation. A 100 milligram capsule was inserted at the time of operation into the wound and allowed to remain from 5 to 8 hours. No untoward results have occurred and there has been no interference with the closure of the wound, in fact they have healed as rapidly as the benign hypertrophy cases. No fistulæ have developed.

Postoperative radium treatment. Five cases were operated on first and then given radium. Two received 1600 milligram hours at time of operation; the other three were given 100 milligram hours treatment after the wound had healed. These cases, like the others, left the hospital voiding normally.

RESULTS

The time elapsed since treatment has not exceeded 4 years, so it is quite possible that some may develop a recurrence. Four cases have now lived 3 years and are apparently entirely relieved of symptoms and local tumor. Statistics show that 12.1 per cent of the cases have an excellent result—classified as good result. 66.6 per cent were improved and 21.2 per cent remained unimproved. The cases showing good results have a complete subsidence of all urinary symptoms and no further development of local tumor. Those cases improved show relief of symptoms but rectal examination discloses active cancer present. The 21.2 per cent unimproved did not get relief by operative measures. There was still urinary difficulty with palpable cancer in prostatic tissue. Of the 33 cases 51.5 per cent have died. Death was due to metastases in all cases. These cases lived from 5 to 22 months—an average of 11 months after operation. Those cases in which good results were obtained received a combination of radium before and after operation. The amount of radium before operation did not exceed 2000 milligram hours in 2 of the cases. Two received 2500 and 3100 milligram hours. The operations were the conservative type. The amount of radium given after operation ranged from 1200 to 2100 milligram hours, giving a total radiation of 3000 to 4000 milligram hours. These cases have not been examined for 1 year but they report that their urinations are normal. Last rectal examination, 2 years after operation did not show any return of cancer.

There are two cases recently treated with large pre-operative doses of radium. Each received 4000 milligram hours. Two weeks later a perineal prostatectomy was done. Both specimens removed at operation showed hypertrophied tissue invaded by cancer. The capsule stripped readily and was free from cancer. Apparently complete resorption of the cancer had taken place in the capsule. It is fair to believe that control of the growth has been accomplished in these cases and that by removing the adenoma a cure has been obtained. Those cases receiving only postoperative radium apparently did not receive sufficient radiation as they occur in the unproved group.

HISTOLOGICAL PICTURE

Study of the specimens removed at operation is the only method of deducing accurate conclusions regarding the effect of radium. The histological picture is by no means uniform. The sections from some of the specimens removed

radium whatsoever. None of the specimens showed complete destruction of all the cancer tissue, although there were areas in which destruction was complete. Just why there was such

irregularity in the histological findings we do not know, but there are several possibilities which must be considered, viz., kind of cancer, the frequency and method of treatment, and the specific or selective action of radium for certain cells.

The action of radium has been found to be of two kinds (1) a gradual disappearance of the cancer tissue and the development of fibrous tissue and (2) necrosis.

The gradual changes produced by radium have been well described by Drs. Young and Fronts (2) and Dr Alter (3) The effect of radium does not correspond in all cases to the amount of radium given. Some tissues show marked changes while others show little change that can be ascribed to radium. The periphery of the specimens naturally shows the first evidence of radiation. Different conditions of degeneration can be easily seen in many of the specimens such as pyknosis of the nuclei, vacuolization shrinking of the cytoplasm, and in some cells a few poorly stained granules. Other cells show granules taking very deep stain Increase in fibrous tissue is a prominent factor in most of the sections It is firm the strands are packed tightly together and form a dense hard tissue. Between some of the layers of fibrous tissue small darkly stained granules or outlines of a few cancer cells may be seen, indicating complete destruction of the cancer with development of fibrous tissue

In all the cases treated with extraglandular methods no necrosis of tissue was found. Whenever a change occurred it was a picture of gradual melting away of the cancer tissue and a development of fibrous tissue. One specimen had been treated intraglandularly with two needles. Each needle contained 12 5 milligrams of radium and was allowed to remain in position for 24 hours The operation occurred 2 weeks later Sections from this specimen showed necrosis of all the tissue within a radius of 4 millimeters. The connective tissue stroma as well as the cancer forms a necrotic area (see figure 5) No such areas have been seen in the other specimens although some

kinds
m and
cause a diversified histological picture. There are three kinds of cancer of the prostate thus far recognized (1) the scirrhus with small cell nests and large amount of fibrous tissue (2) the adenocarcinoma, and (3) the cellular or medullary

The scirrhus is not an uncommon type and is composed of dense fibrous tissue in which are small irregular nests of cancer cells, each nest containing from 5 to 10 cells. The cytoplasm stains heavily Mitoses are rare. One gains the impression of very slow-growing infiltrating type of cancer Of the five cases showing scirrhus cancer only one shows changes accredited to radium and this change is found only in the periphery The other four cases do not show any evidence of the effect of radium although two received over 2000 milligram hours of radium

The adenocarcinomata comprise the largest proportion of specimens. The effect of radium on this type is variable. It is apparently resistant to relatively strong doses of radium, as some of the specimens had large amounts of radiation with little effect while others showed an effect which corresponded to the amount of radium given No 4718 is a case which received 2000 milligram hours in the same area in 9 months Section through that area shows typical active cancer with moderate connective-tissue stroma. No 9038 shows after 4000 milligram hours of radium given in 6 weeks a benign adenoma invaded with cancer The prostate was removed *in toto* and sections were cut at different levels. Large areas containing solid masses of degenerated cancer cells were seen throughout the section. Here and there were a few masses of cancer cells which appeared perfectly normal in shape and outline. There was no swelling vacuolization or granular condition of the cytoplasm Mitoses were rare Why these areas remain unaffected when adjacent cancer tissue on all sides shows degenerative changes is an unsettled question The connective tissue was rather marked in amount, but the benign adenoma was not affected Twenty-seven of the 33 cases were of the adenocarcinoma type 7 showed generalized carcinomatous degeneration in various stages. The amount of radium varied from 900 milligram hours to 4000 milligram hours. Of the 20 remaining cases only 8 showed changes in the periphery while 12 did not show any evidence of degenerative effect from the γ rays although these received from 900 to 3000 milligram hours.

The third type or cellular cancer of the prostate is in gross a very soft mucoid chocolate-colored material. Microscopically it is found to be made up almost wholly of cancer cells interspersed here and there with collections of red blood cells There is a very small amount of connective tissue stroma. One case was found among the 33 cases. Fourteen hundred milligram hours of radium were given—but no change due to radium could be discerned from the study of the sections.

CONCLUSIONS

1 A combination of radium and surgery offers a possibility for treatment of cancer of the prostate and seminal vesicles.

2 Operation does not diminish the amount of radium necessary to produce good results.

3 Operation does not increase the possibility

n all cancer tissue.

6 Radium has two distinct actions one of gradual cell destruction and fibrous displacement and another of necrosis.

7 There are three kinds of cancer of the prostate (1) scirrhus, (2) adenocarcinoma, (3) cellular or medullary

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SHORT CIRCUIT OF THE VAS DEFERENS

By KARL P MORAN M D., F.A C S., PORTLAND OREGON

IN the year 1902 Martin (1) of Philadelphia in collaboration with several others gave out the results of a series of experiments which they had performed upon dogs with a view to perfecting
for the reli
ing bilater
These investigators felt that the success of their experiments justified them in performing the operation upon a human subject in cases in which a childless marriage was the result of azoospermia, consequent upon a double obliterating epididymitis.

Acting upon this belief Martin performed the operation upon an apparently healthy young man anxious for children whose wife had been previously subjected to dilatation and curettement before it had occurred to any of those interested that the fault might possibly lie with the husband. Under ether the vas at the left side was freed about the level of the top (of the) testis its lumen opened and the epididymis exposed for its entire length. The vas was then implanted in an incision in the epididymis by means of four fine silver wire sutures a suture was placed at either end of the vas incision, and the vas itself held open by a suture on either side. Motile spermatozoa were demonstrated in the semen 19 days after the operation

Martin remarks that the approach to the epididymis is not difficult, nor does it seriously endanger the nutrition of the testes by interfering with their blood supply The vas lies behind the spermatic artery, which sends its main branches forward to the inner side of the epididymis, anastomosing freely at this point with the artery of the vas. The portion of the vas which is used for the anastomosis must be carefully dissected free from its surrounding vessels and nerves, and carried to the outer side of the vascular plexus of the cord until it can be readily applied to the exposed surfaces of the epididymis. Because of the smallness of the structures involved the operation is tedious rather than difficult.

About the time of Martin s operation Scaduto (2) carried on extensive experiments upon dogs, but did not prove his conclusions by operating upon a human subject. Posner (3) in Germany also was successful with animals, but his six operations upon man were all failures. The meagerness of the literature for a number of years afterward gives evidence that very little attention was being paid to the possibilities of this particular line of work, and Quinby (4) writing 6 years after Martin, found no other recorded instance of its successful performance upon man Quinby himself experimented with guinea pigs, and concluded that from his results, added to those obtained by Martin and the others, there was no doubt that vaso-epididymal suture with proper technique is a perfectly definite surgical possibility Applied to the human being after the diagnosis of permanent azoospermia due to obliterating epididymitis has been established there are three considerations which favor the employment of such surgical intervention First, the condition after operation cannot be worse than it was before second, since the restoration of patency on one side alone is sufficient to permit ability to impregnate, this offers the patient a double chance of cure, third the operation offering as it does the only rational means of relief from such a condition of sterility has been proved feasible in both animals and man

In the performance of the operation it is necessary to consider carefully the seat of the stenosis in relation to the anatomy of the parts, and in each instance make the union at a place which will as surely as possible create an efficient short circuit. The determination of such a spot on the epididymis can best be made by the hypodermatic syringe. Withdrawal of a drop or two of fluid and demonstration of motile spermatozoa by microscope will show clearly where to make the anastomosis.

In 1907 Hagner and Fuller of Washington (5) reported on two cases of sterility following double gonorrhœal epididymitis where operation was performed one being done by Hagner and the other by Martin of Philadelphia, the Martin technique being employed in each case. Live spermatozoa were afterward demonstrated in the semen of both patients, but at the time the report was made no pregnancies had yet occurred though the author remarks ' I continue to hope." He adds ' Very few of these operations have been reported.

When William T Belfield (6) made his address as chairman of the Genito-Urinary Section of the

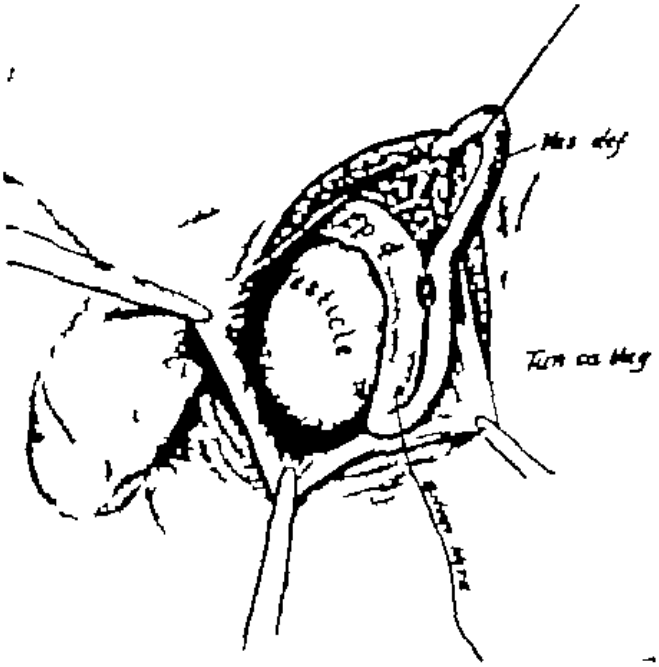


Fig 1 method of anastomosing as with epididymis Silver wire place

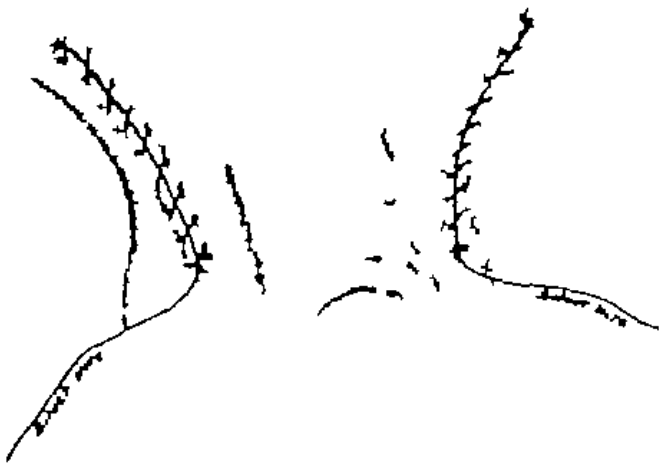


Fig 2 Appearance of operative field after suture is completed

tage of the wife, but with microscopic examination of the husband s semen He went on to speak of the various causes of male sterility and its treatment but made no mention of Martin s operation nor the possible relief of that particular form of sterility by surgical means.

However by 1915 there was a more general recognition of the practicality and usefulness of "short-circuiting the vas deferens. McKenna carefully outlined his technique which differed considerably from that used by Martin, and

plenty of free sperm also that the tail of the epididymis should be used for the implantation. Shortly afterward Bernhart (8) in a short article on the technique of the operation stated that,

the hope of overcoming this difficulty He stated that his technique had proved successful in eight consecutive cases, and that four pregnancies had rewarded his operative efforts.

Yet almost two years after this Wolbarst (9) ignores the work of both McKenna and Bern hart and says In gonorrhoeal obstruction there is but one measure that offers some degree of hope—the Martin operation—vasoepididymos-

tient his only chance. He says In a personal experience of 18 patients I have met with gratify ing success in one case Spermatozoa were found in fairly large numbers and moderate efficiency within 4 months and pregnancy followed within a year thereafter" But McKenna continued to offer a much more cheerful outlook for anxious would-be parents In 1918 (10) he made further reports on successful operations and also gave details of a new technique differing somewhat from that he had used 3 years before Shortly after this the patient whose case I wish to report presented himself at my office.

H. W L first consulted me in April, 1919, concerning

and he consented to have it performed.

under the microscope and showed many lively spermatozoa.

sides the same day

As soon as the patient was able to leave the hospital he went to Chicago where he remained for 6 months. On his return to Portland he came in for examination and two different specimens of semen showed many live spermatozoa. His wife who is now 37 years of age is at this time 7 months pregnant.

The technique employed was that of McKenna's later method. He directs that the incision should be made just long enough to expose both vas and epididymis, recalling that the obstruction to the spermatozoa usually occurs in the globis minor. He employs the silver wire because without its use the lumen would fill and become occluded with blood-clot, which would become organized and render the operation of no value.

The results which have been obtained from this operation certainly would seem to justify its employment much oftener than has heretofore been the case.

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TETANUS COMPLICATING DIABETIC GANGRENE

By WALTMAN WALTERS, M D Rochester, Minnesota
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IN view of the fact that the standard textbooks of medicine, surgery or even of diabetes do not mention tetanus as a complication of diabetic gangrene, I am reporting a case of this type which has been under observation in the Mayo Clinic. A study of this case seems to demonstrate that tetanus may develop as a terminal infection in patients with diabetic gangrene and that prophylactic treatment is indicated in certain cases.

REPORT OF A CASE

appetite increased noticeably the total urinary output

the onset of symptoms

When the symptoms of tetanus were first noticed, a

appreciable effect

teristic of the nervous system involvement in late cases of diabetes mellitus

An unusual detail obtained from the history was that the patient's urine had never been examined for sugar.

thyroid was slightly enlarged but no adenomata were palpated, nor were there signs of exophthalmic goiter The peripheral arteries were markedly sclerosed, and rolled under the finger like a non-elastic tube Over the discolored area of the right foot sensation was absent, and pulsation was not felt in the right posterior tibial artery A 12-hour specimen of urine revealed 6 per cent sugar in 900 cubic centimeter a specific gravity of 1,030 a large albumin content, and occasional hyalins and

The original source of the infection is uncertain, but the patient's daughter volunteered the information that the infected toe had never been covered by a dressing and had been in direct contact with a black sock Treatment in such cases after the tetanus is well established will not be of much benefit, consequently prophylactic antitetanic serum is indicated

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EDITORIALS

SURGERY, GYNECOLOGY AND OBSTETRICS

FRANKLIN H. MARTIN, M.D. — Managing Editor
ALLEN B. KANAVEL, M.D. — Associate Editor

JANUARY 1922

EDITORIAL FOREWORD

THE journal of SURGERY, GYNECOLOGY, AND OBSTETRICS is the official organ of the American College of Surgeons. The editors are fellows of the College and the majority of the editorial staff are members of the Board of Regents of the College who serve in this capacity ex officio. Through the generosity of the founder of SURGERY, GYNECOLOGY AND OBSTETRICS, Dr. Franklin H. Martin, arrangements have been made whereby the journal will eventually become the property of the American College of Surgeons.

During the years of its existence the Journal has ever maintained a high standard of scientific excellence. To speak further of the great work that has been accomplished by the journal in the advancement of surgery would be super arrogation. The publication of extensive collective reviews in which a surgical subject of importance has been brought fully up-to-date has proved to be of great value, especially to those interested in the subject reviewed. The editorial board has decided to establish a department of editorials in which some surgical subject will be more briefly placed before the surgical profession by a recognized authority. It is hoped that these short editorials will be of value not only to those specially interested in the subject discussed but by their brevity will also appeal to the surgical profession as a whole.

WILLIAM J. MAYO
Chairman, Editorial Staff
for the American College of Surgeons

HIRSCHSPRUNG'S DISEASE

IN an interesting paper read before the American Surgical Association at its last meeting and published in a recent number of the *Annals of Surgery*, Dowd has brought the question of the surgical treatment of megacolon pretty well up-to-date. He has also compiled a list of the literature upon the subject published since 1908, supplementing the list collected by Finney at that time.

During the last 13 years while much has been written on the subject, little of value has been added to our knowledge of the etiology of the disease and it must be admitted even now that little definite is known as to the true causation of the affection. Evidence is accumulating all the time to support the contention that in many cases at least no single cause is responsible for the various manifestations that have been noted from time to time by different observers. In all probability more than one factor is involved. The fact that so many theories as to its etiology have been advanced is the best evidence as to the uncertainty of our knowledge of the subject. These various theories may be roughly stated as—

1. Some congenital developmental defect in the colon. Hirschsprung whose name has been given to this disease, was a strong

popular but to the conditions that exist in this particular affection it seems perhaps better adapted than any of the methods of resection hitherto employed

J M T FINNEY

ACUTE PLEURAL EMPYEMA

THE problems associated with acute pleural empyema loom large in the daily routine of the general practitioner the internist, and the general surgeon

Forty years ago the routine treatment was aspiration and the important detail was to aspirate the fluid without permitting air to enter the pleural cavity The persistent chronic cases were treated by drainage, the tube being passed through one of the intercostal spaces.

Then came the practice of rib resection and drainage, the object being to secure more efficient and thorough emptying of the plural sac, using a larger tube and avoiding pressure necrosis of the ribs This was regarded as a distinct advance and indeed it was. The tube caused less discomfort, and opportunity was afforded to remove masses of fibrin and thus shorten the period of convalescence.

The experiences of the training camps during the scourge of influenza,—which so frequently produced a virulent empyema,—that swept through America in 1918 and of the late war changed our views on many points relating to the pathogenesis and treatment of empyema, infected joints, and the infected abdomen.

The mortality rate was lowered by the return to the use of the aspirator and a less frequent use of the drainage tube

In civil practice the more common source of infection is undoubtedly the lung and the visceral pleura, although infection through the diaphragm is probably more frequent than is sometimes realized Occasionally the original focus may be in the parietal pleura.

The presence of fluid in the cavity of the pleura is not difficult to recognize and yet from time to time one hears of cases of *empyema necessitas* and of rupture into the bronchus followed by death from drowning Delayed resolution of a pneumonia should always suggest the possibility of a pleural effusion as the cause, and a report from the nurse or the mother that there has been an attack of dyspnœa during the night should confirm the suspicion of lung compression. The point is so easily settled by a small exploring needle that one wonders why pleural effusion is ever overlooked

An empyema differs from an abscess in the abdomen for instance in having one rigid wall. This fact makes it all-important that the pus should be removed before the visceral pleura becomes so thick that it prevents the lung from expanding and resuming its place against the ribs

No doubt the variety of infection plays an important part in the prognosis and treatment, hence the value of a combined cytological and bacteriological examination of the fluid withdrawn. Aspiration, repeated several times if necessary favors lung expansion and may be all that is required If there is found to be a tendency to recurrence and chronicity then is the time for drainage, but drainage with every precaution against infection from without, and for a limited period of time. Finally if the pleural sac is rendered sterile or nearly so by Dakin solution or other agents closure of the opening without drainage gives admirable results in many cases, even in those in which aspiration is indicated and may need to be repeated several times during convalescence.

The sooner these patients can be got out of bed and encouraged to move about in the fresh air the more quickly do they recover

G E ARMSTRONG

THE MANAGEMENT OF GASTRIC AND DUODENAL ULCER

ONE of the most striking facts in connection with chronic ulcer of the stomach and duodenum is the number of earlier conceptions which have undergone great changes during the past few years The evolution of ideas with regard to such ulcers has been synchronous with the surgical treatment of the disease, and it is doubtful that the knowledge thus obtained could otherwise have been acquired In spite of the present wealth of accurate information, however, many questions are still unsettled and consistently satisfactory treatment of the disease cannot be expected until they are solved

Although the cause of ulcer is not clearly understood, probably because of its complexity and the close relationship to the neurogenic system, it is significant that it is rather generally agreed that the selective localization of pathogenic bacteria is, as shown by Rose now, a most important factor Until the cause of chronic ulcer is sufficiently understood so that it may be recognized and adequately dealt with, the diagnosis and treatment of the disease are the chief concern

The great value in the close association of the well-qualified internist, roentgenologist, pathologist, and surgeon is particularly well exemplified in the interpretation of gastric symptoms, and their composite opinion will be correct in 95 per cent of cases In no other intra-abdominal disease has diagnosis become so accurate as in chronic gastric and duodenal ulcer, and it is to the screen and the plate, in experienced hands, that a large measure of *the success in attaining this efficiency must* be accorded.

Such an efficient method has led to one difficulty, namely, the tendency to forget the patient and his complaint in the presence of visible abnormalities or disease The danger of such an attitude has been emphasized in several recent papers and is a timely warning in view of the rather large margin of error in the roentgenological diagnosis of ulcer in the hands of the inexperienced The opinion of the well trained clinician who is able properly to evaluate special diagnostic aids and is familiar with the results of methods of management, continues to be the most reliable basis on which to determine the best course for the patient.

The principles of treatment of gastric and duodenal ulcer are becoming quite generally agreed on. However decided surgeons may be that chronic duodenal and gastric ulcers are surgical conditions, they also recognize that there is a stage in the development of the lesion during which it may well be subjected to medical management alone The number of early ulcers which heal spontaneously or are permanently cured by medical means can not be determined because of the difficulty of recognition. It will be an even greater problem to learn why some ulcers heal and why others under apparently similar conditions become chronic. Most surgeons agree that every early ulcer should have a thorough trial of cure under medical régime if the patient can afford the time and expense necessary When, in spite of treatment, an ulcer becomes chronic and recurrent, the best immediate and late results are achieved by surgery

Surgeons are not in complete agreement as to the best method of surgical management. This is fortunate since the difference of opinion will bring out the truth more rapidly

than will blind adherence to a standard method of treatment. In any discussion of the relative merits of the different operations for gastric and duodenal ulcer it should not be forgotten that gastro-enterostomy and its results brought about and justified the adoption of surgical measures in the treatment of ulcer Another point which is often overlooked is that gastric and duodenal ulcers are distinct entities and should always be so considered particularly from the standpoint of their surgical management.

A further suggestion might be made, that the surgical management of ulcer should always be discussed on the basis of *site situation, character and complications.* An operation which may be clearly indicated for one ulcer may be quite ineffective in another The trend of development in the surgical management of chronic gastric and duodenal ulcer has been toward more radical measures

The desirability of excising a gastric ulcer unless local conditions contra indicate, is now quite generally accepted and in ulcers which have been associated with bleeding the wisdom of destruction or excision is obvious. Gastric resection for gastric ulcer and pylorectomy or partial duodenectomy for duodenal ulcer is now being advocated by British and continental surgeons. Such procedures mark the limits of surgery at least from a technical point of view Whether the ultimate results of partial gastrectomy for ulcer will prove to be better than the results which follow local excision of the lesion by knife or cautery combined with gastro-enterostomy or pyloroplasty is a question. If the results are better the question arises whether they are sufficiently so to offset the added risk of the radical operation, especially in inexperienced hands. For sound reasons the excision of the duodenal ulcer combined with the pyloroplasty of Finney is gaining favor with the surgical profession when it can be done without more risk than gastro-enterostomy with cautery or knife excision.

The subsequent course of patients operated on for gastric ulcer is not so satisfactory as the course of those operated on for duodenal ulcer The subsequent death rate in duodenal ulcer is not higher than the death rate in the general population of similar age and sex but the subsequent death rate following operations for gastric ulcer is three times the average death rate in a corresponding group of persons in the general population. Gastric ulcer is a much more serious malady from all standpoints than duodenal ulcer and the fact may be emphasized that these diseases should always be considered and discussed independently

The liability of cancer after operations for gastric ulcer (a liability which is present after all types of operation, including gastric resection) the occurrence of secondary ulcers which may also be sequels to any gastric operation, postoperative hæmorrhage, and the varying results in apparently identical cases subjected to the same treatment, are only a few of the questions, further knowledge of which will be important to this ever interesting subject.

DONALD C. BALFOUR.

CORRESPONDENCE

CANCER OF THE AMPULLA OF VATER

To the Editor Since the publication of my article on Cancer of the Ampulla of Vater, in the June 1921 number of SURGERY GYNECOLOGY AND OBSTETRICS my attention has been called by Dr Gustav Pallin surgeon to the University of Lund to an excellent article of his in Bruen s *Beitraege* [illegible] und seine chirurgische [illegible] ticle Pallin refers to several cases of cancer of the ampulla of Vater treated by radical operation which I had failed to find in the books of reference at my disposal I therefore take pleasure in summarizing the cases reported in Pallin s article, thus rendering my article more complete and at the same time acknowledging the work that Pallin has done.

CASE 1 Operated upon by Rixford in 1901 Cholecystostomy Operative recovery 4 months later Recurrence

CASE 2 Operated upon by Voelcker in 1904 Transduodenal excision with hepatic drainage Died in 2 days.

CASE 3 Operated upon by Morian in 1905 Transduodenal excision with cholecystojejunostomy Operative recovery Later metastasis.

CASE 4 Operated upon by Akerblom in 191 Transduodenal excision with cholecystostomy Died in 9 days.

CASE 5 Operated upon by Hirschel in 1913 Resection of duodenum end-to-end anastomosis resection of part of pancreas gastro-enterostomy Well after 1 year Apparent recurrence

CASE 6 Operated upon by Clermont in 1913 Transduodenal excision. Died

CASE 7 Operated upon by Docq VanPaever in 1914. Transduodenal excision. Operative recovery

CASE 8 Operated upon by Docq-VanPaever Transduodenal excision. Died on fourth day

CASE 9. Operated upon by Wrede, in 1914 Transduodenal excision. Operative recovery

CASE 10 Operated upon by Wrede in 1914 Transduodenal excision. Died.

CASE 11 Operated upon by Wrede in 1905. Transduodenal excision. Drainage of common duct Operative recovery

CASE 1 Operated upon by Akerblom. Transduodenal excision. Cholecystectomy Died in 2 days

CASE 13. Operated upon by Lundblad in 1919 Transduodenal excision. Died.

Three other cases by W Mayo Riecel and Czerny died following operations or from recurrence

ROBERT M LEWIS M.D

Baltimore.

PRE-OPERATIVE PREPARATION OF PATIENTS WITH OBSTRUCTIVE JAUNDICE

A CORRECTION

In the article by Dr Waltman Walters in the December 1921 issue of SURGERY GYNECOLOGY AND OBSTETRICS, line 40 page 655 third paragraph, should be corrected to read from 20 to 34 hours after the removal of the [illegible] M. H MELLISH Editor

Rochester Minn. *Mayo Clinic*

BOOK REVIEWS

A CRITIQUE OF NEW BOOKS ON GYNECOLOGY AND OBSTETRICS

IN a long preface of 6 pages Roberts and Kelly[1] mention the influence of the war the necessity for massage, and the teaching of early American authors on fractures. An outline summary of the material included in this new edition presents the authors' views on fractures, and the twenty fourth point of the summary which advises that Joint fractures should not be kept immobile longer than one or two days careful passive and active movement usually should be allowed within the first few days" might well be said in large type

The first 138 pages are devoted to general remarks on fractures and are full of meaty material set down in a fashion which invites easy reading The general chapter on treatment is particularly good warning is again made against untrained operative interference on fractured bones. The use of the Lane plate is favored. One is pleased to find the meaningful term "open and closed fracture used in the text.

There is much lacking in the description of the mechanism of fracture that has already found acceptance in the literature of the subject. Also the description of the symptoms of fracture fail to lay sufficient stress on the importance of localized tenderness and pain. Fractures of the carpal bones are given scant space Regarding the valuable constant traction treatment for metacarpal and phalangeal fractures, no illustrations are given and little is said. It is to be regretted that there is not one specific reference to the literature in the whole book.

The remarks on the use of the X-ray in diagnosis in so inadequate a space.

From a general viewpoint the grouping of illustrations photographs of methods of treatment, except operative treatment, and especially those of specimens, are clear and businesslike. One photograph of
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to
its wealth of illustrations KELLOGG SPEED

THIS little book,[2] now in its third edition presents a concise and correct account of the more important facts of regional anatomy The text is lucid and the material presented has been carefully selected The author has wisely chosen to confine his attention to the structures and relations of greatest practical importance, emphasizing and elucidating them by brief references to their clinical applications, and has left to textbooks of surgery the non-anatomical details which encumber most texts of surgical anatomy

The book would, however have a greater field of usefulness if the illustrations were of better quality and furnished in greater number Moreover the author continues to use the old English terminology and has not even seen fit to include the B N A. terms in parenthesis Since the Basle Anatomical Nomenclature is now employed in nearly all the larger texts and atlases of anatomy used in this country American medical students are more familiar with the new than with the old terms and the usefulness of the book has thereby been considerably impaired S. W RANSON.

THE work[3] before us is brimful of just the information needed by the radiologist for the rational analysis and interpretation of the X ray plates of bone and joint disease. Liberal space is devoted to fractures, but the more important and highly valuable portion of the work is the major section devoted to the elucidation of Baetjer's well-known philosophy of bone shadow interpretation.

[1] TREATISE ON FRACTURES IN GENERAL, INDUSTRIAL AND MILITARY PRACTICE. By John B. Roberts, A.M., M.D., F.A.C.S., and James A. Kelly, A.M., M.D. 3d ed. revised and entirely reset. Philadelphia and London: J. B. Lippincott Co. 1921.

[2] A MANUAL OF SURGICAL ANATOMY. By Charles R. Whittaker, F.R.C.S. (Ed.), F.R.S.E. 3d ed. revised and enlarged. New York: William Wood & Company. 1921.

[3] INJURIES AND DISEASES OF THE BONES AND JOINTS. Their differential diagnosis by means of the roentgen rays. By Frederick H. Baetjer, M.D. and Charles A. Waters, M.D. New York: Paul B. Hoeber, 1921.

The work abounds with axiomatic truths which cannot be too often emphasized. Roentgenology is not a picture process but a medical procedure based upon careful analysis and logical deductions from the shadows observed upon a plate and the translation of these shadows into pathological terms. The ability of the roentgenologist depends not so much upon his technical skill as upon his familiarity with the general problems of medicine and surgery

American roentgenology is proud of this work which is bound to make itself felt very promptly in greatly improved averages of success in the X ray diagnosis of bone and joint lesions.

JAMES T CASE

DELAYED in publication by the World War, this the second edition of the *American Year Book of Anæsthesia and Analgesia*[1] covers the advances in the science and practice of anæsthesia and analgesia during 1917–1918 The collected papers and researches are contributed by eminent authorities of the allied professions who are vitally interested in current advances. The several chapters devoted to anæsthesia at the front and war surgery of the base and reconstruction hospitals will be found valuable for future military use, as

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to operation under narcosis. Contributions on the newer local anæsthetics, their pharmacology comparative toxicity and value in local anæsthesia in general surgery and in dentistry and oral surgery are presented as well as pertinent papers on anæsthesia and analgesia in obstetrics which are of practical value

An added feature of this edition is the cumulative index of the world literature for 1917–1918 which is developed under subject headings, and which makes a convenient bibliography for reference

ISABELLA C. HERB

GENERAL pathology[2] conceded to be the foundation of medical science and practice, is nevertheless, likely to be neglected in the reading of the average clinician The work by Oertel is an admirable outline of the subject, clear concise, and readable.

as physicochemical relations

and which in most instances, find definite anatomical expression The attempt is made to present pathological anatomy and histology in such a manner that the processes of disease may be clearly visualized The historic development of present ideas is traced

The volume, intended as an introduction to the study of medicine covers a broad field in general outline. It contains only 357 pages. An extensive bibliography has been omitted, there are no illustrations. For use as a text supplementary laboratory experience is assumed. The discussion of etiology comprises 160 pages, possibly a dispro- -

detailed discussion.

The value of the work lies chiefly in its concise ness and clearness of expression, in its interpretation of pathology as changes in cells and their relations produced in accordance with biological laws, and in its emphasis on visualization of the pathological picture. This book should prove stimulating both to the graduate and to the student of medicine.

W H NADLER

WHEN as students in medical school we were attempting to lay a broad foundation for our medical knowledge, to systematize the numerous

textbooks stood out in our minds as particularly helpful and valuable—Osler's *Medicine* and Stewart's *Manual of Surgery*[3]

The appearance of the fifth edition of the latter published after the death of its gifted author with the assistance of Dr Walter Estell Lee, makes us realize anew the sense of personal obligation we always felt to Doctor Stewart for his concise, clear cut and admirably simple presentation of the principles and practice of surgery

The edition in question is considerably larger than its predecessors, due to numerous additions, and to a different "make up' It has been carefully brought up to date by the inclusion of the lessons learned from the war—particularly those concerning the treatment of infected wounds of the various regions of the body the treatment of fractures, of nerve injuries, and of shock. The sections dealing with plastic surgery, with the treatment of empyema, with the surgery of the abdomen, reflect the ideas of a surgeon of skilled judgment, thoroughly abreast with the advances being made in varied fields.

No textbook, particularly in medical fields, is perfect The inclusion of old illustrations, such as that illustrating obsolete methods of nerve anastomosis, of obsolete procedures such as the majority of those mentioned in the treatment of trigeminal neuralgia, the omission of mention of the ordinary Thomas splint for the treatment of fractures of the lower extremity, or of the Jones modification of the Thomas arm splint for fractures of the humerus the failure to mention the importance of a metabolic rate determination in the diagnosis of

[1] THE AMERICAN YEAR-BOOK OF ANESTHESIA AND ANALGESIA 1917–1918 F H McMechan, A M M D Editor New York Surgery Publishing Company 1921

[2] GENERAL PATHOLOGY an Introduction to the study of medicine By Horst Oertel New York Paul B Hoeber 1921

[3] A MANUAL OF SURGERY for students and physicians By Francis T Stewart, M D 5th ed. Philadelphia P Blakiston's Son & Co 1917

a toxic goiter are illustrations of small imperfections well-nigh unavoidable. We feel that a little more definite reference to sources, to those who have contributed largely in special fields would have added to the value of the volume

Minor omissions and slight imperfections, however, do not affect our belief that the author has left behind him an enduring monument, both to his ability as a writer and to his skill and judgment as a surgeon. S. L. KOCH.

BOOKS RECEIVED

Books received are acknowledged in this department and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender Selections will be made for review in the interests of our readers and as space permits.

AIDS TO OPERATIVE SURGERY By H. C Orrin, O B E., F.R.C S (Ed) New York William Wood & Company 1921

GREEK MEDICINE IN ROME THE FITZPATRICK LECTURES ON THE HISTORY OF MEDICINE DELIVERED AT THE ROYAL COLLEGE OF PHYSICIANS OF LONDON IN 1909-1910 WITH OTHER HISTORICAL ESSAYS By The Right Hon Sir T Clifford Allbutt, K.C B., M.A., M D., F.R C P etc., New York The Macmillan Company, 1921

ESSAYS ON SURGICAL SUBJECTS. By Sir Berkeley Moynihan, K C M G., C.B Philadelphia and London W B

STAFF OF THE WOMAN'S HOSPITAL IN THE STATE OF NEW YORK. Edited by George Gray Ward, Jr M D F A C S vol III, 1920

A TEXTBOOK OF MIDWIFERY FOR MEDICAL SCHOOLS AND COLLEGES IN INDIA. By Kedarnath Das, C I E M D Calcutta and Simla Thacker Spink & Company 1921

cott Company 1921.

OBSTETRICS AND GYNECOLOGY Edited by John S Fairbairn, M A B M B Ch (Oxon) F.R.C.P (Lond.) F R C.S. London Oxford University Press, 1921

CLINICAL DIAGNOSIS FOR STUDENTS AND PRACTITIONERS By F DeQuervain 3d English ed. translated from the 7th ed by J Snowman, M D New York. William Wood & Co 1921

ATLAS FOR ELECTRODIAGNOSIS AND THERAPEUTICS.

A TEXTBOOK OF SURGICAL ANATOMY. By William

F A C.S, Philadelphia and London: J B Lippincott Company 1921

ARRÊTS DE DÉVELOPPEMENT MALADIES DE L'OVULATION By Dr Paul Delché. Paris. L'Expansion scientifique Française, 1921

DIAGNOSIS. (A
n, M.D., F.A.C.S.,
Troy New York

AMERICAN COLLEGE OF SURGEONS

REPORT OF THE HOSPITAL CONFERENCE HELD AT THE CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS OCTOBER 24, 1921, PHILADELPHIA[1]

MORNING SESSION—THE PRESIDENT GEORGE E. ARMSTRONG M.D., PRESIDING

HOSPITAL STANDARDIZATION, ITS INCEPTION, DEVELOPMENT, AND PROGRESS IN FIVE YEARS

BY FRANKLIN H. MARTIN M.D. CHICAGO
Director-General of the American College of Surgeons

YOU have all undoubtedly asked yourselves why this program of the American College of Surgeons has been received with so much approval, why it has attracted so much attention, why it has had so much influence.

Scientific medicine is developing so rapidly that of necessity it is reducing the number of the medical profession in proportion to the people they have to care for. Medicine therefore, is becoming more wholesale and institutional, less retail and domiciliary. That of necessity has placed an enormous responsibility upon the hospital, because the hospitals must be the institutions in which the wholesale or group medicine is practised.

The American College of Surgeons is responsible for the standardization of hospitals, because in its early days it found it necessary to standardize its own environments. For instance, in making a standard for admission to fellowship it was necessary that we ask the candidates to furnish us the reports of fifty major operations and fifty minor operations, in lieu of an examination. These reports began to come in. They were on all kinds of forms. There was absolutely no standard record on which they could give us the evidence of their own ability to practise surgery. Soon we were asked from every direction to furnish a standardized system of records, to suggest a form upon which these records could be given to the College. We attempted to do that a great many of them—began to ask us if we could not in some way furnish these same standardized records or forms to them, which, of course, we were very glad to do.

That was the first step in the standardization of hospitals. Then, early during the war it became necessary for us to have some other minimum standards that would apply to the hospitals in the camps, the army hospitals. And in Washington was called a conference of medical officers and we discussed a minimum standard for military hospitals.

After that, in one year the American College of Surgeons formulated its minimum standard for hospitals. Is there anything that a hospital can leave out of that standard and be a hospital? First, records; second, staffs, with staff meetings, third, a competent and honest staff, fourth, laboratories. That is practically the minimum standard of the American College of Surgeons. Any hospital that cannot furnish this minimum standard is not a hospital. It is the very minimum thing we could ask of hospitals to do in order to have us recognize them as hospitals.

That led immediately to a survey of the hospitals to ascertain which hospitals met this minimum standard. For the last three or four years surveyors employed by the College have visited all of the hospitals of one hundred or more beds in the United States and Canada.

SUMMARY OF YEARLY REPORTS

In 1918 of the 692 general hospitals of one hundred or more beds, in the United States and Canada, 89 met the standard; in 1919, 198; in 1920 407, or 57 per cent; and this year 568, of a total of 761 hospitals, or 74 per cent, meet the standard of the College.

Due to lack of space, the editor has taken the liberty of omitting portions of various addresses.

1921 REPORT

Today we have the pleasure of presenting to you our annual report on the hospitals of North America, having one hundred or more beds. This list contains the names of such general hospitals in the United States and Canada as have met the minimum standard. In this list, a certain number of institutions are designated with a star. This group includes those hospitals which, when visited, had adopted the fundamental principles of the minimum standard, but which at that
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star instituted these measures at an earlier date and consequently received the benefits of a longer experience in the workings of the program and a broader conception of its application.

THE FUTURE PROGRAM

The program of the future will be extended to include all general hospitals of fifty or more beds in the United States and Canada. Of these institutions, many of which have been visited a

with the percentage of the larger hospitals approved on first inspection. If proof were needed of the universal application of the minimum standard the acceptance by the smaller hospitals would furnish it. Stressing only broad fundamentals, the minimum standard molds itself to meet specific needs, nowhere impeding initiative or fettering judgment. Rightly conceived and carried out, it makes the hospital the proved guardian of the community health, rendering scientific service to all.

WHY THE COLLEGE MUST CONTINUE THIS SURVEY

Now surgeons and hospital superintendents, what is the future program of hospital surveys other than I have indicated here? Why should the American College of Surgeons continue this work? It should continue the work because it is the measure that the College has of the fitness of the men who we expect will enter the College. It is impossible for the College to do anything but to take the leadership in the question of its own standard. It is something that we cannot delegate to someone else. Therefore, as long as the American College of Surgeons is in existence I can see that it will be the duty of the American College of Surgeons—duty to itself—to see that the environment in which its candidates do their work is of the proper kind. Therefore, this work will have to go with the College. The success of this work, I believe you will all realize, lies in the fact that back of it is a great ideal for service and honesty. And this is the reason the program has succeeded far beyond our expectations.

HOSPITAL STANDARDIZATION FROM THE VIEWPOINT OF THE MEDICAL PROFESSION

By ROBERT L. DICKINSON, M.D., New York.

M.D. as this meeting looks, Mr. Chairman, it represents a revolution that has come very quickly and very surely. Years ago Dr. Codman asked of the medical profession and of hospitals: Do you dare show us your end-results? A Dr. Martin takes up this challenge and with a Bowman and a Moulinier puts it into effect, and in working order on a surgically sane basis. Hospitals have been answering that challenge ever since and their answer to the challenge represents the effect of hospital standardization.

Hospital standardization might belong to the American Hospital Association, that wonderfully able body represented here so fully. But standar

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accounting. If it could be done in government, if it could be done in finance, it can be done here. Honor, honesty and efficiency can be measured.

Let us come to the staff review. I take it the

experiment a while yourselves. Start the machinery. Try it out. I think the time has come for the College to give us a sample procedure for staff meetings, adaptable to different types of hospitals.

One other pitfall. Here is a surgeon knowing that he should not have a mortality in his active service we will say of more than 4 per cent, and who therefore refuses to endanger his mortality record by certain operations. I do not want

any man to refuse to open my abdomen because he might exceed his death rate You have to have fearless surgery today

Now, on the other hand the reckless experimenter with human life must be curbed. Some of the greatest surgeons are the most reckless. How are we going to take counsel in any of these great things unless we do as Codman has told us to do? We should charge up an error of judgment or of technique when indicated and, in other cases, wipe that physician's record clean from censure who operates upon a patient *in extremis*, hoping to save a life In other words this matter of fair surgical mortality must be formulated and *I think the College is the authority to act.*

The hospital trustee comes to me and says 'You know my interest in this matter What should our records be? What is a fair mortality? What is a fair infection in clean cases? The College has given us certain averages. What would be a normal average? This is another place where the College might compile and publish interesting suggestions. In my opinion the time has come to define a few other minimum standards.

Another point regarding the staff meeting It should be for mutual stimulation and encouragement. Nothing is gained by turning it into a fault finding clinic. We must bring in individual triumphs as well as failures. Then the staff meeting will make for better effort.

When all is said and done, gentlemen, the whole story comes down to this You cannot *legislate these things. As the last speaker has* said the answer to all progress in medicine depends upon the elimination of the unfit, and the development of individual honor and competence.

THE HOSPITAL SURVEY OF THE COLLEGE IN 1921

By FREDERICK W SLOBE, M D Chicago
Hospital Standardization Department, American College of Surgeons

IN January of this year when the hospital program of the College for 1921 was evolved, it was decided to limit the survey to thirty months of hospital visiting This was from necessity rather than from choice. Consequently hospitals which were fully approved in 1920 were not revisited this year Follow-up visits to these hospitals, however were postponed only temporarily Particular attention was directed toward those hospitals which either were not on the approved list last year or which were listed with an asterisk. In addition, as many as possible of the fifty bed hospitals were visited also

The survey was conducted through personal visits by a corps of seven hospital surveyors. These men—all physicians—were from medical schools and hospitals of widely separated sections of the country They were given a course of training at the College headquarters, followed by survey work with experienced hospital visitors. This uniformity in training assured the College of uniform reports, which constitutes one of the essential features of the College program. Whether a hospital were in Maine, therefore, or in California, each institution was visited and surveyed on the same basis. Further, by visiting a large number of hospitals scattered over a wide range of territory, these surveyors obtained a general, rather than a local view-point. This policy of personal visits by relatively few, uniformly trained hospital surveyors is one of the most important elements of the College program

There are certain difficulties experienced by hospitals in their endeavor to meet the standard of the College which merit special emphasis.

Relative to staff organization, one of the chief difficulties seems to be the adoption of a type of staff meeting which actually analyzes the clinical results. Slowness in developing a co-operative, group spirit among the physicians seems to be the chief hindrance. As this spirit develops the purpose of the staff meeting becomes more nearly realized. In the average hospital a combined staff meeting is essential. Teaching hospitals, however and other hospitals with highly specialized staffs, and hospitals having a staff membership of only one or two physicians, form certain exceptions to this rule. In such instances, departmental conferences, teaching clinics, and individual analyses take the place of the combined staff meeting

The adoption of an official resolution pro-

groups. In the first group are institutions, in which, apparently, the practice has not been unknown and where consequently difficulty was expected *It was a distinct surprise, however to* meet opposition to passing such a resolution in

practically unknown. Some of these hospitals were very hesitant about passing resolutions condemning the practice. When they began to realize, however that they served as powerful examples for other hospitals in which the practice was prevalent and that the College must apply a uniform policy toward all hospitals they responded. That the viewpoint and stand of the College in this matter is amply warranted is evidenced by the impression gained by our hospital visitors, that the practice of fee-division is present to some extent in nearly every state and province, even though it may be practically unknown in some sections.

Case records are improving steadily although they still constitute the greatest difficulty in many hospitals. Two factors stand out most prominently in impeding the development of proper case record systems in hospitals first, the lack of proper interest in the case records by physicians and hospital executives themselves second, the lack of internes The first is just as important as the second, because even a full quota of internes without sufficient supervision will often fail to secure adequate records. When

terest in supervising the records, most of the difficulties in this connection will be solved.

Laboratories have shown a similar steady improvement. There is a demand for laboratory equipment, technicians, and pathologists, which has been hitherto unknown One handicap to the development of adequate laboratory service is the system of making a separate charge for each laboratory test performed. This difficulty has been obviated in many hospitals by establishing a flat rate fee to include most of the usual laboratory tests Tissue examinations should be included in this flat rate, otherwise it is difficult to obtain routine examination of all tissue removed at operation. Although the flat rate fee may not be applicable in all hospitals and may be inadvisable in some, it has been of tremendous help to many hospitals in solving their laboratory problems

Last year out of the 704 hospitals in the United States and Canada having a capacity of more than one hundred beds, 407 or 57 per cent,

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bed hospitals has grown to 761 Of this number 568 or 74 per cent, are on the list. Of these 568 18 per cent, are listed with an asterisk, showing the great relative decrease in the number of hospitals listed with an asterisk this year The asterisk has been used to indicate those institutions which, although they have instituted measures adopting the fundamental principles of the standard, have not developed them to their fullest efficiency at the present time.

Besides these larger hospitals, 704 of the fifty bed hospitals were visited during the past 2 years. According to our records, there are about 875 of these hospitals, leaving about 150 which have not been visited. It is the hope of the College to visit all of these smaller hospitals next year so

The attaining of the minimum standard of course is not purported to be a resting place in the pathway of a hospital s progress. It is no ultimate standard. There are many things beyond It does, however contain the basic fundamentals and that, doubtless is why so many hospitals have adopted it.

HOSPITAL STANDARDIZATION FROM THE VIEWPOINT OF THE HOSPITAL SUPERINTENDENT

By ALFRED K. HAYWOOD, M.D., Montreal
Superintendent, Montreal General Hospital, Representing Canada for the American Hospital Association

MODERN hospital administration has become a specialized profession within the past twenty years. Hospital administration today is not only a science, but a business. Those of us who have been hospital administrators for years realize that we are only at the beginning. Our hospitals stand for two purposes; they teach and they heal. It is not possible in every community that every hospital be a teaching hospital, but each one must be a healing hospital. If we hospital administrators are going to take our place in the community without a pretense, when we go out to financial men for aid, we must be in a position to show them the result of our work in black and white. We must prove by results that we are entitled to public confidence and support.

This procedure places a certain increase in [illegible] There with a we are not content with that. The majority of the reports are not legible. We must have a typewritten report. That means an extra stenographer and typewriter and extra equipment, and I can assure you that anything done to get 100 per cent of hospital standardization, as we have tried to do it, has meant increased expenditure to the hospital. But I can assure you in addition to that, it has given us 500 per cent increase in results. A record for which we spent a thousand dollars a year was not worth 10 cents when 5 years went by and we couldn't use it. Certainly the money we spent on records heretofore was absolutely useless. Now, we can get our records at any time and they are logical and contain every detail. We are considering putting in additional equipment and when the time comes that one of our surgeons seeks information we hope he may make use of it.

RECORDS—HOW LONG SHALL WE KEEP THEM?

This brings up the question, How long shall we keep our records? That has bothered a great many of the administrators of our hospitals. You cannot admit seven or ten thousand patients a year and keep a full record of all of them and expect to be able to house such records with the quarters that are available.

If our records are to be of the use they are expected to be, we cannot turn the patient out of the hospital without a very beautifully kept history. We turn our patient adrift as cured without the further knowledge at some late date whether or not the time and money spent on the cure of the patient will be lost. That consequently brings up the follow up system. It is almost impossible for us to know that a patient has had proper treatment unless we use the follow up system. And to conduct a follow up system properly costs a great deal of money. As a rule that does not matter to the surgeon and to the attending men of the hospital.

The more a hospital administrator understands the difficulties of his attending staff, the more willing will he be to provide the staff with material or equipment to meet the hospital standard or for any other purpose that might be necessary. For that reason hospital standardization has indirectly brought the attending staff and the hospital administration much closer together.

STAFF MEETINGS

I think it has been conclusively proved that staff meetings properly run can be of immense benefit to the patient—to the patient first, because that is the ultimate object of our hospitals—and to the attending staff second. How staff meetings are to be run is a question of opinion. One hospital superintendent says it is best to serve luncheon in conjunction with the meeting. When this is done fewer members leave the meeting for they hear things discussed with less loss of time. I have tried that plan myself and I find it has worked out wonderfully well.

If staff meetings are advantageous from the standpoint of our hospital administrators—and I am sure they are—and if staff meetings are a good thing for the attending staff and a success, why not let us have staff meetings for the rest of the hospital, for the matron of the training school for the chief engineer, the housekeeper the fireman? Why not have them meet and hear one another's troubles? They are all spokes of the same wheel, and I am convinced that the results of such meetings would be 100 per cent beneficial. There is no reason why the chief engineer for instance, should not know something about what

is going on in the hospital. If such meetings are held, you will find that you have a spirit of co-operation among the workers, they work together not against one another—a condition we used to see so often

AUTOPSIES

Hospital administrators are anxious to have as many autopsies done in the hospital as possible. I think it is safe to say that the hospital administrator takes more personal interest in the securing of these autopsies in very many cases than the attending man

Consent for postmortem examination can be

Hospital I am not doing it myself I have nothing to do with it, but a member of my administrative staff has. Last year we secured permission for postmortem examination in 86 per cent of all deaths in the hospital and this year to date we have secured permission in 87 per cent.

Hospital standardization brings to the administrator of the open hospital—I am not speaking —a con-

It does

weapon.

But this much we do know that in open hospitals the work has not been of the same caliber as the work done in closed hospitals. The hospital administrator today in the open hospitals has in his hands with the aid of his committee of management a means, we will not call it a weapon, whereby he can come before his attending staff and tell them that they must meet the conditions contained in the minimum standard. He can say to them Yes, we will give you an open hospital but in order to derive any benefit from this open hospital, you must meet our minimum standard.

HOSPITAL STANDARDIZATION FROM THE VIEWPOINT OF THE HOSPITAL TRUSTEES

By NEWTON E. DAVIS, D.D. Chicago
Executive Secretary Conference Board of Hospitals and Homes of the Methodist Church

I COME to speak to you not from the standpoint of a trustee of a hospital but from the standpoint of the executive secretary of the Board of Hospitals and Homes of the Methodist Church which during the past year has had for

work in our various institutions, especially of the church with which I am affiliated

We had no Board. Since that time a Board has been organized, and the very first question that came before us for consideration was What standard shall we adopt and put into effect in regard to our hospital work?" There was only one answer to that—the minimum standard adopted by the American College of Surgeons. That is the best there is at the present time. Whenever we do see a better plan than that adopted by the American College of Surgeons, we shall add that to our already adopted program

BOARDS OF TRUSTEES

In making a survey of our hospitals during the past year 65 operating institutions, we have to begin back with the board of trustees, and we find some very interesting facts in our survey Now there are four kinds of boards of trustees, inasmuch as there are State institutions, municipal institutions, private institutions, memorial in character more or less, and also institutions operating within the bounds of some one of the denominations. So we have practically four kinds of boards of trustees. The State hospitals deal with their trustees through their State-appointed officers and trustees the municipal hospitals, through officers and trustees appointed by the municipality and the private hospitals are largely run by physicians with particular ob-

ent objectives in each group.

Now I will take up our own church hospitals. For instance, in an organized society, we have a body of men, the laity and missionary people, who want a hospital and want the church to get back of it. The important objective of any of these hospitals is the same, that is, that the patients shall have the very best kind of service rendered to them, from the diagnostic standpoint, the standpoint of treatment, or whatever it may be.

When we come to the standardization program, one of the first things that we find is that we have

to standardize a lot of boards of trustees. There are as many and varied kinds of ideas among boards of trustees as to what is the standardization program of the American College of Surgeons as there are among some other classes of folks who are non medical practitioners And we have had some very interesting sessions with men who for years have been president and secretary and treasurer of boards which have had very little to do with the hospital program. We have had this question asked many times 'Who are you? What does this mean anyway? Most of them think it means expenditures of money and it does. But without expenditure of money we can never get to any place in the world And I have been very frank to say to these members of our trustees You have run the institution on a cheap plan and you will have a cheap result. It means that you will have to expend more money and the best results cannot be secured without putting into it an adequate amount of money And the boards of trustees of many of our institutions are very unconscious of the fact that none of our institutions can turn out the best product unless they provide conditions which are favorable.

CO-OPERATION OF TRUSTEES AND STAFF

So we face this problem. Many of our trustees have never been in close contact with the staff They do not know what the staff wants to do They do not know what a case record looks like. It is absolutely unreadable to them. And so you must educate the board of trustees to know what a really readable chart is and what kind of an analysis should be made in order that patients should have the very best means of diagnosis and the very best service rendered them

FINANCIAL INTERESTS

Another feature directly concerns the Board of Trustees. They are tremendously interested in the financial interests of the hospital. I know one instance where a board of trustees had notes at the bank amounting to fifty five or sixty thousand dollars, they were running behind in their current expenses, they did not know just how to meet them, or where they were going to get the money to buy all the equipment that the hospital was calling for The proposition came up of a new staff organization in the hospital, which would entail the expenditure of an additional amount of money Could they afford to add additional expense to the already great burdens *in order to establish a standardized staff?* And in organizing that standard staff the plan was to determine and specialize the entire staff development. And the president of the Board of Trustees said frankly, after he had been in close contact with the chief of staff "We cannot afford not to put in the additional equipment, to put in all the standard requirements regardless of the extra expenditure of money that it does entail! '

Another instance here is a hospital with a board of trustees which during the past years has not been making any reports to anybody They have not been responsible to anybody This board of trustees has been a unit in itself as a hospital, not making a report to any city or State. But somebody else comes along—the American College of Surgeons—and says to the surgeons of the staff "You do not meet the requirements. A man from the outside steps in and says "Can we see your hospital records? Can we examine your laboratories and equipment and see what you are doing?' If the surgeons and physicians in your community are to be held responsible for the results of their services in the institution, then the responsibility for that must come back to the board of trustees and also to the people outside who furnish the money to keep the institution going

LAYMEN PLEASED WITH PROGRAM

We started in to adopt the whole program and the result has been that the boards of trustees are doing their duty toward their institutions and toward the community whereas a year and a half ago they were letting the staff attend to responsibilities today they have a larger view of their problem, and a more intelligent appreciation of the work that the institution is trying to do for the City, the State and the Church

There is one more word I want to bring to you I believe that the body of laymen throughout the entire country are tremendously pleased with this great program. Why should they not be? As business men asking for the best results, they could do no better than adopt the program of the American College of Surgeons. A man can only sell something if he has it to sell. He cannot sell what he does not have in the shop So the doctor who says I can do certain things,' but cannot produce the goods does not last very long We have had some non medical practitioners who have said 'We will close your doors unless we can bring in our patients, regardless of your rules and regulations. The State can hold the board of trustees responsible to the State. They *have not gone that far yet. But the State has a* responsibility as to what the board of trustees

does, and the responsibility for every case that comes into the hospital comes back to the trustees in the end. If that is so, then the other truth is self-evident that no board of trustees can allow practitioners to come into the hospital who cannot give proper diagnosis or proper treatment or do proper service. They must meet the requirements. And I am sure I speak this morning for a very large number of people and a large number of institutions, and I am very glad, indeed that the doctors of the American College of Surgeons have made up this program during the past 3 or 4 years and have established a standard Dr Martin has been the life-saver for hundreds of physicians.

In closing so far as our own institutions are concerned we intend to stand by this program and see that it is put into effect.

THE RELATION OF HOSPITAL STANDARDIZATION TO LABORATORY SERVICE

By JOHN M BALDY M D Philadelphia

DOCTOR Haywood, who spoke just before Dr Davis, had a thought which I would combine with what I have to say and with what Dr Davis has said. And that is the thought of a club over the medical men. I have never liked to admit that to myself but I have not seen it realized in hospital administration. That is exactly what it ought to have There are enough men who need a little jogging Can you hold a club over medical men? The whole question of hospital standardization is utterly hopeless if on the job allow their names to be used and abused and perhaps know nothing about their actual duties.

Now as bearing on the laboratory and as far as the laboratory is germane to these thoughts, it is just this.

The boards of trustees have no better club the boards of trustees have no better source of information, as regards the competency of their staff as regards the earnestness and honesty of their staff as regards the obedience of their staff to the rules and regulations of the hospital, than is furnished by the laboratory Do these men in business take things for granted and receive no reports? I do not believe they do They would not be the successful men they are if they did. And they would not be wanted by the people of the community to head their hospital organization because they are not getting reports of their business. Then why should they not ask to have systematic reports from the heads of this organization? If the board manager will say to the staff to the superintendent, to the pathologist, etc, that every month he expects to have laid on his table reports of exactly what has been done in each department—so many tests for typhoid, etc.—and if in addition to that the name of the physician is placed opposite the number of the case, it will mean something You will find that one man in the surgical department has asked for a hundred tests and another has asked for three. The first time that happens—very well, we call attention to the contrast. And the second time, it grows into a serious conference and the surgeon is told that this hospital board expects every man to do his duty we do not like the looks of this contrast this laboratory costs money we have expended money on it we want his record to show as well as Doctor Smith s—who has a hundred, while he has three It must be corrected. And the third time "We are sorry but we want your resignation. And you have to ask only one man on that hospital staff to resign. And if you want to get something out of your laboratory the young man just out of college looking for a field is the man you can depend on. I would like to call attention to the fact that that is one prime duty of the pathologist, to check up you medical men, and that applies to all the medical staff If he is a man of the proper caliber if he is educated to the fact that that is part of his duty if he is educated to have tact and not to lead his colleagues in the wrong way they will be glad to have his counsel. He is there not as a technician He is there as a consultant.

And I say to you boards of trustees by this system you can tell what every man can do. You have it in the laboratory you have it in the record system. Every hospital should have an historian I mean an employe, call him what you choose, whose prime duty is taking care of the records and rejecting absolutely every sheet that comes in improperly filled out.

THE STANDARDIZATION PROGRAM OF THF AMERICAN COLLEGE OF SURGEONS

By Rev CHARLES B MOULINIER, S J Milwaukee
President, Catholic Hospital Association

THIS is the first time I have been put down on the program to present the plan of the American College of Surgeons. And yet I think, during the three and a half or four years that I have been co-operating with the College, I have always been talking on that topic.

You have heard already what are the requirements of the standard. You have heard a great deal about organization of the staff, about the records, about the laboratories, and the division of fees, and about the autopsy work. I shall not go into any technical details because they have been set before you by those who have technical knowledge. I shall try to present to you, in as few words as possible what seem to me to be the great historic facts of this movement for better hospitals—the scientific fact that underlies it *the ethical basis of it, and its bearing on the re* ligious thought and feelmg and spirit which is inevitable.

when, following that wonderful movement, it began to look to the interests of the interne some 8 years ago Some 5 or 6 years ago, the American College of Surgeons stirred down into the depths of its soul, began to realize that it had a mission for the better care of the sick in the United States and Canada and made up its mind, as you all know and have been told, to improve surgery But everybody also knows that you cannot improve surgery unless you improve every thing that centers in the work of the hospital And so the American College of Surgeons had not gone very far with its efforts and purpose to improve surgery when it realized that it had to improve everything in medicine.

Knowing that the Council on Medical Educa tion had begun this work, the College, in its fine spirit of honor and regard for the profession went and said This is what we want to do, what are you going to do? ' And the reply was ' Go on and do your work and we will stand by and help you.' Therefore, you members of the American College of Surgeons, take it down deep into your hearts that you have been doing a wonderful work for the whole profession in bettering hospital service to the public.

That is the historic fact—absolutely unquestion able because I know it from personal experience in the movement from the very beginning and hence I always take an occasion like this to say "All honor to the American College of Surgeons. ' And furthermore, they are in the middle of the work. It is well begun. They have gone on let us say toward the middle of it and they must carry it on to the end, because they are the only body of people as far as I can judge, capable of finishing the movement, at least up to that point where it is sure and safe and sound and destined to go on. That is the historic point of view

Scientifically it seems to me that this should be said The mind of the medical profession is being reached as it was never reached before, to make it more keen more analytical, more cau *tious, and more co-operative in its scientific com*bination of thought, in its analysis of assembled facts, in its careful, gradual, step-by-step arrival at a diagnosis. And this grows out of the or ganized staff This grows out of the monthly staff meeting, or weekly departmental meeting, as the case may be. It has brought about that the medical profession working in the hospital has come to the conclusion that minds must get together, that facts must be assembled, and the *right analysis of those facts arrived at either by* the individual a small group or the whole staff In other words, gentlemen, without intending it, as I observed throughout the continent, the medical mind is being convinced by this program of yours that the time for independent and sepa rate and distinct and hostile personal thinking is past in medicine. Today everybody is con vinced that no medical thought is finally safe for the patient, for the public, until several minds *have agreed. Standardization therefore, in as* far as it means organization of staff in as far as it means monthly conferences, has meant a great development of the medical mind through out the country, and, above all, a great devel opment of medical character Men today in stead of being distinct individuals, are growing into the greater stature of men working with their fellows, an embodiment of much greater capacity and character communicated into action.

Just one more word about these monthly con ferences. I believe there is an incomplete ap-

preciation of what they mean The College speaks of them as clinical conferences, as investigating the clinical experiences of the hospital. But the College does not say except impliedly that in these monthly conferences lies the secret of the success of the whole movement Your records will not amount in value to the paper they are written on, your laboratories will be useless, you will get no autopsies worth while, the unjust division of fees will go on, unless your monthly conferences are genuinely are sincerely are absolutely high-minded and get down into the very heart and soul of every man Because, gentlemen, what is the monthly conference? It is a review of what was done at the whole institution for every patient that came into the hospital I do not care how many statistics you have, how correct they are, the facts in figures are without the scientific soul of the facts, unless the soul of the medical man is big enough to analyze those facts Thirteen deaths in the past month means nothing Why did each one die? So many unimproved in the hospital means nothing Why are they unimproved? What has been the use of the laboratory? Why haven t we had more autopsies? Gentlemen, it is hard It just tears the soul out of a medical man to have to face his own failures, his own incomplete work, his own missing of diagnosis, his own failure to have consultation when he should have had it, his own incapacity to assemble the great facts involved in the case and then miss in his diagnosis or fail in his operation or somewhere in his treatment. They call it a minimum. I call it a fundamental.

And here let me make a plea, such as was made here on the stand this morning for the

know I might help me.

Now just one more word on that question of the monthly meeting The American College of Surgeons has a mission There is an apostleship for them to take. They have not been brave

tion and at the same time attend to the business of the monthly meeting What has been done for our patients? Where have we failed? Where have we succeeded? Papers, discussions, cases are not the real thing in those meetings. There is no intention on the part of the College to displace

engineer to superintendent, including the nurses, the orderlies and everybody—what have we done for our patients during the past week or month?

The College started with the thought of bettering surgery They are in the midst of bettering the whole practice of medicine Why? Because the heart of the movement, the heart of the record, the heart of the monthly meeting the heart of the service in the laboratory—I mean scientific heart and ethical heart—is diagnosis It all centers on diagnosis no hurried no snap-shot yet no elaborate (beyond human frailty) diagnosis, but a genuine sincere a definite, direct, cautiously and deliberately arrived at diagnosis of what is the matter with the patient. That is the heart and soul of medicine.

Here again I would like to say a word of commendation a word of praise, a word of congratulation to the members of the American College of Surgeons throughout the country for the thoughtful, the really scientific, and the deeply conscientious way in which they are going at this program. There is no doubt about it, gentlemen, if I am at all safe in my conclusion on the reading of medical history that there has never occurred a movement equal to it in the past history of our race Here we have a great body of men on a great continent—and it is sure to reach the rest of the world—facing a tremendous ethical responsibility by a keen administration that is scientific of the laws of health. It is done because you all, down deep in your hearts—and particularly is it true of the hearts and minds of those men who have led the movement, Dr Franklin Martin, Dr John Bowman, and others in the office who have led the movement—feel that it is the greatest in the history of medicine.

If I may be allowed just a few more words At the first meeting you had in Chicago when you began this plan, I was fortunate enough to be asked to address you. There were there three hundred members of the American College of Surgeons and the title of the program was Hospital Standardization." And I can recall with a great deal of vividness that at the end of the

tion of the medical profession, in mind, in character and in heart."

REPORT OF RECOMMENDATIONS OF THE AMERICAN RAILWAY ASSOCIATION IN CONNECTION WITH HOSPITAL STANDARDIZATION

By DANIEL Z. DUNOTT M.D BALTIMORE
Chairman, Medical and Surgical Section, American Railway Association

I HAVE been requested to speak to you this morning on what the railroads have been doing in connection with this program of standardization. And in order that you may form some idea and reach some conclusion as to just what we will be able to do to assist in this movement I think it might be well to spend a minute or two on the question of what the organization is that I am speaking for

The American Railway Association is an organization made up of the presidents and managers and operating officials of the various railroads throughout the country that are members of this Association. The Association membership comprises about two hundred and eighty-four thousand miles of railroad in the United States and Canada, and you will therefore see that practically every railroad in the country is a member of this Association

The Association itself is conducted in the following manner It has its own president and its general secretaries and secretaries of sections. The operating officials of the American Railway Association, the men who pass upon the recommendations made by the various sections of the Railway Association are the general managers and the president and vice-president of the railroad, and while the action of the American Railway Association itself is not compulsory or mandatory, it becomes a forceful action as a recommendatory practice because the very men who are called upon to accept the recommendation of the American Railway Association are the men who have favored such action.

The American Railway Association has numerous sections. It is needless for me to go into details in regard to them. Our section is the

bers of the Association. This section was first incorporated in the American Railway Association about a year ago. And one of the first actions [illegible] to take up , because that our

employes injured in service must get all possible care and attention.

The committee on hospital standardization discussing this subject made the following recommendation through its chairman Dr A F Jonas, of the Union Pacific Railroad

' The medical and surgical section committee on hospital standardization held a meeting at Chicago on April 6 1921 In accordance with its understanding of its purpose, it has adopted the minimum standard as the basic recommendations for the railroads of the Association."

The recommendation of the committee was accepted and it was submitted to the various members of the sections, who unanimously approved it and on the sixteenth of November it will be submitted to the annual session of the American Railway Association, and I have no doubt in the world will be approved.

Now this will mean that the railroads through their surgical service will take the position that they will have their men treated in hospitals that meet with the minimum standard of the American College of Surgeons. You appreciate as well as I that a large amount of our work is of an emergency character and that, therefore, we cannot always be choosers. There will be times when we will have to put men in a hospital that has not adopted the minimum standard for hospitals. But it is our intention wherever it is practicable to remove those patients from such hospitals and put them in a hospital having the minimum standard just as soon as consistent with safety to the patient. I do not know but what it is a pretty good thing to follow that up even a little bit closer than that. I am sure that in a number of instances the transportation of a man seriously injured—crushed leg we will say—for a greater distance to a better hospital would be giving that man a greater opportunity for recovery than putting him in a hospital that was not up to the standard in its work.

GREAT IMPULSE TO STANDARDIZATION MOVEMENT

We have in the railroads about thirteen thousand doctors and students acting in the capacity of surgeons for the railroads. And we have about 275 or 280 men who are members of

surgical staffs. And with the railroads taking this position, I believe that it will be a tremendous factor in assisting the bringing of standardization over a larger field

I cannot give you the exact or even the approximate number of hospitals that are used by the railroads. I hoped to be able to get that but I could not. I know that the Baltimore and Ohio uses about 310. The Pennsylvania railroad uses about 277 hospitals. The Union Pacific, on the other hand, a railroad of about nine thousand miles, or three thousand four hundred miles larger than the Baltimore and Ohio uses only about 123 The Union Pacific has 20 hospitals that are under its own control at least that they contract with. The other hospitals are hospitals that they have used from time to time in emergency

The railroads use four-fifths of the hospitals of the country and while of course a large number of the hospitals have already reached the minimum, still there is a very large field which will be affected by this position of ours, and I can assure you the doctors of the American Railway Association are going to take the position not verbally but actively

THE INDUSTRIAL HOSPITAL

By EDWARD MARTIN M D Philadelphia
Commissioner of Health, State of Pennsylvania

SHORTLY after our last election in Pennsylvania, in talking with the attorney general, I said The woman s vote has not been conspicuous for its power And his reply was, Doctor there ain't no such animal as the woman s vote." And so in regard to the industrial hospital

With some exceptions in some localities and in some businesses, I think, and my belief is, that there ain t or should not be such an animal as an industrial hospital. The problems of industry are the problems of civil life.

We see much of special courses in industrial surgery The basis of industrial surgery is the fundamental medical education, a long training under the eye of an expert, and that training that fits men for surgery in general

Each industry has its particular form of accidents and each industry must have special experience in that line and a school of industrial surgery cannot be established in Louisiana, Pennsylvania, or even in Massachusetts, but must be based on that sound, fundamental, surgical knowledge acquired by elbowing or being with a master of his craft and then further knowledge

The answer to industrial surgery would seem to be comparatively simple. There are some people who are obsessed, who are possessed, who are enthusiastic, who are—we will say—crazy in certain directions. They are the people who lead the progress of the world. Who of you, going back to your school days, going back to your graduating period, who of you would accept any full time position with no opportunity of rising beyond the high-school course? Who of you would want to lose his ambition and serve an industry on a given annual sum for which they assume the entire responsibility in their hospitals and care for the people of that industry? That is a check strap to all future progress. So that seems to be the simple answer, "There ain t no such animal as an industrial hospital." There ain t no such animal" as an industrial surgeon. It belongs to the best of the profession to guide and train those who are coming on.

THE INDUSTRIAL DISPENSARY

By F L RECTOR, M.D., New York
Secretary Conference Board of Physicians in Industry

THE industrial dispensary need not have the equipment or personnel of a hospital unless it is remotely situated. The average industrial plant is in or near a community with hospital facilities The care of minor injuries is all that should be attempted in the routine work of such a dispensary major work being sent to the larger and better equipped general hospital. In those cases where the industry is remotely situated it will be necessary to provide more ample hospital facilities but in these cases the general hospital becomes more of a community institution for the workers and their families in cases of injury or severe illness, while the smaller

and more convenient dispensaries for treatment of minor cases are placed in the plant itself

Dr Clark of the Norton Company believes and others agree, that it is necessary from the standpoint of economy and production that no employee should be ordinarily over 15 minutes from a dressing station In a scattered organization this need can be met by having branch dispensaries in charge of nurses placed at strategic points throughout the work for the first care of ill at the regular By this means a maximum service can be supplied to workers

Just a word about records in the industrial dispensary A fairly representative experience in the inspection of industrial dispensaries has shown that those who keep adequate and intelligent records are in the minority I have found record forms varying from a blank 3 by 5 library card to a form 10 by 12 inches in size, both sides of which were filled with information about the worker Many industrial dispensaries religiously collect records and just as religiously file them away without any attempt at analysis.

The proper use of such records can be of great assistance to the production department, as many times the information that they contain will bring to light causes of retarded production that [illegible] to be of material assistance to the work of the public health authorities.

The physical examination of industrial workers is made of greater value by a proper record system. One important point is frequently overlooked in this work. Some physicians insist upon a very detailed record of the examination of every person, thereby consuming valuable time without an adequate return to the employer or employee. In this connection this fact should be kept in mind there is a big difference in the physical examination of the industrial worker and the hospital patient. In the case of the worker we are dealing with an individual who is well or thinks he is well, and who is being examined for a specific purpose namely his ability to perform certain kinds of work. Only those conditions which have a bearing upon his employment are of immediate interest to the examiner In the other case the hospital patient is sick or thinks he is sick and the examiner is justified in going to extreme lengths if necessary in order to find out the true condition of the patient

The earnest effort of most of the physicians in industry to utilize the services of all who apply, even though some may be defective, is doing much to break down the opposition to physical examinations that has existed on the part of some workers and particularly the labor organizations The Conference Board of Physicians in Industry has formulated the principle that, provided there are positions to be filled, employment should be denied no one unless when employed, he becomes a danger to himself to others or to property

As to staff organization in the industrial dispensary, I found in a recent survey of over 200 plants that in 101 establishments with one or more full-time physicians, there was an average of one physician to each 3 083 workers. Please keep in mind that the figures just quoted are *averages* only In any given case the staff organization required will depend not so much upon the number of employees to be served as it will upon the character of the industry and the different functions delegated to the medical department.

Another important consideration of the work [illegible] the medical department. In visiting nearly 100 industrial plants in New England last year it was found that in only 39 was the medical department under the direct supervision of an executive of the rank of works manager or above, while in 44 other plants the responsibility was to the employment manager, industrial relations superintendent or other subordinate official.

In the survey of 207 plants just referred to which covered more generally the larger industrial sections of the country, the same conditions were found to exist. In 108 plants the works manager or a higher executive supervised the medical work, while in 95 plants this work was under the person in charge of industrial relations, safety, employment or compensation office manager, or other subordinate. Obviously the work of a department of the importance of the dispensary should be accorded the standing of other major divisions of an industrial establishment.

Discussion on Industrial Hospitals and Dispensaries

John B Lowman Johnstown, Pennsylvania It has been my privilege to be connected with, I think, perhaps the best industrial hospital that was ever built in the United States, forty years ago At that time, as you know the corporations did not realize what benefit they would derive from taking care of their own sick and wounded. Through my father the Cambria Steel Company was induced to build a small hospital for the care of the sick and wounded. They appropriated the sum of ten thousand dollars for this hospital and founded ten beds. It was very hard at first to get any patients into this hospital establishment But finally after a certain length of time the usefulness of it was discovered by the corporation and that hospital has been increased from that time on, until last year they built a new hospital costing about eight hundred thousand dollars. That simply meant the advisability of taking care of the sick and wounded not only from the humanitarian standpoint but also from the financial standpoint.

period, there were one hundred and twenty five thousand accidental deaths in this country Thirty five thousand were killed in industries. Seventy-one thousand were killed outside of industries. Of this number twenty five thousand children under the age of twelve were killed There were two million injured, the disability lasting one month or more And basing our statistics on the monthly disabilities, I would say there are twelve or fifteen million minor injuries of a disability of less than one month. In Pennsylvania in 5 years there were fourteen thousand two hundred and forty two fatalities, three hundred and twenty seven thousand serious and six hundred and fifty-three thousand minor injuries, making a total of approximately one million accidents in the State of Pennsylvania within 5 years, or seven hundred each working day There were fifty-one thousand accidental and violent deaths in Allegheny County between the years of 1903 and 1920 inclusive The compensation costs in this State, for the killed and injured in these 4 years, amounted to forty-eight and a quarter million dollars The statistics of the New York Compensation Commission show that 33 per cent of the cases coming up for compensation adjustment require further reconstructive surgery In other words, the general surgeon's or the general practitioner's work has to be reviewed and referred to an orthopedist or some one else who is doing his reconstructive work. That is an indictment of the character of work that has been done by the general practitioner A speaker of the State Compensation Commission some few years ago

indictment against our general surgeons and

of treatment.

Some of our failures have been due to neglect in therapeutics We have absolutely neglected electro- mechano-physical, and hydro-therapeutics. I have it from very good authority a gentleman who has visited every hospital in the country that there are very few of the hospitals which are equipped along these lines And as the result, we are driving the people into osteopathy and to the chiropractor We are responsible for it.

The American College of Surgeons should standardize industrial hospitals

There is no question, gentlemen, that the American College of Surgeons is the institution

land

of

kind,

this or that method has brought about the best results. And in this way the industries having hospitals would whenever possible introduce standard methods.

General Discussion

Mr Daniel D Test, Superintendent Pennsylvania Hospital Philadelphia I want to congratulate the College of Surgeons on its program of standardization, and the splendid progress it has made Hospital standardization means the standardizing of the personnel as well as hospital equipment and practice. This means managers, doctors, and executives and all must have a share in the work Until we seek to standardize ourselves our efforts to standardize our hospitals will be feeble.

So long as managers fail to recognize that sound hospital management rests upon fundamental principles which have been established by experience so long as doctors insist on policies that their colleagues do not want or approve so long as superintendents try to make rules for everything, and then think that their rules are as sacred as the laws of the Medes and Persians, just so long will hospital standardization be impossible and hospital work be inefficient

The old idea of each group being suspicious of, and antagonistic to, the others must give way to a co-operative partnership which will co-ordinate all the efforts which the hospital makes. If this result is attained the doctors and superintendents through their organizations must talk and work for sane standardization, and we must seek to impress upon managers the necessity for their joining heartily in the work, with a view to standardizing themselves as well as their subordinates—the doctors and the superintendents.

The progress which the College has made since its meeting in Chicago 4 years ago should give us fresh inspiration for further effort. Two days were given to standardization at that time. When I think of the first day and a half of that meeting I am reminded of how I was impressed with the great need for [illegible]
cians present.
another spoke
tion but before closing his remarks every one said in effect that nothing must prevent the doctor from having everything he wants and just when he wants it. I was wondering how standardization was going to have a chance when on the afternoon of the second day a doctor began his remarks by saying "It is about time we were turning from the consideration of what we want, to the consideration of what we ought to have, with due regard for the other departments of the hospital. This entirely changed the key note of the meeting and seems to have set a standard for us all.

I do not speak of this in a critical spirit, but merely to show the progress that has been made The attitude at the time was perfectly natural None of us had thought the matter through We were still living under the old dispensation of hospital work. The new dispensation of co-operation has dawned, and the College of Surgeons has sounded the first call.

Mr. John Smith, Superintendent, Hahnemann Hospital, Philadelphia In the 3 or 4 years that the American College of Surgeons standard of *diagnosis and records has been in progress*, we can see a wonderful improvement in the treatment that the patient gets, the treatment he gets immediately after admission, the preliminary history, and the laboratory privileges, and throughout this whole program we have become more careful, and the patients themselves have received a wonderful benefit from it.

George O'Hanlon M.D, Superintendent Bellevue and Allied Hospitals, New York The program has been most interesting and most helpful, not only to those that have already met the standard during the past 3 or 4 years but to those who are still 'without the faith." I am very sure that after this meeting the trustees, the attending staff, and everybody connected with the hospital will make it their individual and combined effort to meet the requirements. They are so simple although in some cases expensive. They can without any difficulty be met.

I happen to be connected with five hospitals, all of them teaching institutions, with one exception. When the standardization of hospitals was introduced, we met the requirements. They are City institutions maintained at the expense of the City of New York.

In passing I might just tell you—those who are unacquainted with hospital organization in New York—that the general hospitals of Manhattan are under a board of trustees. The public hospitals of Brooklyn, Staten Island, and Blackwells Island are under the commissioner of public welfare. The commissioner of public welfare took the lead, 2 or 3 years ago and issued a general order applying to each and every hospital of the Department, directing the staffs to comply with the minimum standard.

For several years it has been our practice to have not only the regular staff meetings and attendant staff meeting but the administrative staff meet at least once each week, the superintendents, assistant superintendents, superintendents of nurses, purchasing agents, doc

tors, and all the people who were recognized as heads of departments are called together each Saturday morning The general affairs of the institution or of the department are taken up and discussed, so that each person knows the difficulties that we have to contend with whether it is difficulties with the attending staff difficulties of infection in the wards The superintendents and pathologists of each of our hospitals attend all meetings of the board and present a report of the work that has been done at each hospital and the sources from which these reports come, so that it is apparent who makes use of the laboratory and who does not and the amount of increased interest and care shown A few weeks ago at one of the hospitals complaint was made that the laboratory service was not satisfactory and the pathologist was not present to report. So the next meeting we asked him to attend and give in detail the amount of work he was doing and the sources from which those requests came. During the preceding month the hospital, with perhaps four hundred admissions, and a very active service, made requests for two blood counts I think six autopsies had been performed They asked why he did not do more. He said no one asked for more that he had on one or two occasions gone into the wards to learn something about the cases, and it was made very apparent to him that he was not welcome, so that he had profited by that experience and lost his interest. And as the result of that conference, the staff are making much more use of the laboratory

GENERAL SUMMARY OF HOSPITAL STANDARDIZATION AS INAUGURATED BY THE AMERICAN COLLEGE OF SURGEONS

By MALCOLM T MacEACHERN M D C.M. Vancouver
Superintendent, Vancouver General Hospital

SUMMARIZING hospital standardization, as inaugurated by the American College of Surgeons You have come here with set opinions, you have gained new opinions, your old opinions have been intensified by this wonderful meeting today But how are we to think of this hospital standardization meeting? What is your psychological reaction? You have been impressed with the fact that this movement pleases all

Now one or two thoughts First of all because of the better working out of the cases in the hospital, because of better diagnoses, because of more intelligently applied treatment because of the staff review conference work, what are your hospitals showing statistically? If we were prepared to present complete statistics today they would absolutely run like this lower death rate reduced number of operations fewer post operative infections and complications and lastly a lessened patient s days stay in the hospital. We have some statistics already showing this conclusively which may be mentioned at the round table this afternoon.

The second thought This movement has created a deep sense of responsibility in our so-called hospital groups in the care of the sick, whether in the hospital or outside First of all the administrative side of the hospital has been affected as you have been told today The staff of the hospital has become more conscientious to its duty Second the medical men have been impressed by the movement and are trying to mold their ways to produce better and more scientific results Thirdly the boards of trustees are realizing their responsibility They are realizing indeed that they must have two reports first, a financial report and second, this report, what I could call the physical report of the hospital, showing the physical assets and liabilities And the assets are patients discharged well and improved The liabilities are deaths unimproved cases infections, and complications. And from these they make their balance sheet.

The next thought what are the people thinking about this? Before they go in for treatment the people are now asking what hospitals are

ned a message of better service in the hospitals of both countries and hundreds and hundreds of thousands of patients, now and later, must surely benefit by it.

Lastly how does it affect the nation? It is one of our great economic questions, because it means that by hospital standardization there are fewer deaths, there is less cost to the hospital in the care of the patient from fewer complications and infections, and finally there is a shortened days' stay in the hospital, which means as the industrial representatives have told you, putting the patient back to producing capacity sooner

AFTERNOON SESSION—ROUND TABLE CONFERENCE

HOW HOSPITAL STANDARDIZATION CAN IMPROVE THE PROFESSIONAL WORK AND THE SERVICE TO THE PATIENT IN THE HOSPITAL

CONDUCTED BY MALCOLM T MACEACHERN M D C.M VANCOUVER
Superintendent, Vancouver General Hospital

DR M T MACEACHERN Before starting the Round Table, I want to mention seven points which I think are stimulating at this time in order that we may give better service in the hospital to the patient, and it may in a way summarize the work.

First giving to the patient upon admission a good reception so as to put the patient in a comfortable mental attitude toward the hospital and the staff so that the patient will react more favorably to treatment.

Second, prompt attention at all times to the patients needs, whether large or small.

Third competent examination of the patient, with a carefull record of the same a careful record of everything concerning the patient while in the hospital.

Fourth, availability and utilization of all the diagnostic and therapeutic facilities necessary in making a good diagnosis and carrying out effectually applied treatment. Get the two points—first, all the facilities for a good diagnosis and second, all of the facilities for effectually applied treatment.

Fifth consultations between your staff consultations between the staff and the administration, consultations both scientific and administrative.

Sixth careful analysis of the work that you heard so splendidly put to you this morning in the staff conference and Seventh intelligent monthly reports to the board of trustees.

Now, this means better diagnosis of your patient, better application of the treatment and return of the patient to producing capacity as quickly as possible in the most efficient and most comfortable manner That is what your patient expects of you as hospital administrators and as surgeons and physicians. That is what the public, as the financial support of your hospital, expects. Just as in a factory putting out a certain product, so our product here is health, which must be of the highest standard Now these services which concern us chiefly today are scientific services of the hospital for which we can set no limit

SECTION A—STAFF ORGANIZATION

1 *Many hospitals find difficulty in formulating staff by-laws, rules, and regulations for the guidance of the professional work therein How can the College give them greater assistance? Can they secure a set of standard by-laws, rules, and regulations setting forth the principles involved which shall guide them in drafting their own?*

DR. FREDERICK W SLOBE, Chicago There have been many changes in the general policy and system of the staff rules and regulations during the past 5 years. Originally, the constitution of hospitals embodied general principles of organization chiefly and contained practically no details relative to the clinical management of the hospital. During the last 5 years, however as a result of the great emphasis placed upon staff meetings and staff organization case records, and laboratory facilities, in the standardization campaign there has been great emphasis placed upon certain rules which would carry into effect the principles of the minimum standard.

Of course there is no one standard set of staff rules and regulations which can be applied to all hospitals. Naturally, a hospital of fifty beds in a small community cannot use the same constitution and by laws which would be applicable to a large hospital in a metropolitan center There fore, the College advises certain broad principles only leaving the detailed application of these principles to the various individual hospitals themselves There are certain general rules however which have been incorporated in practically all of the rules and regulations. Many of these are so elementary that they may seem entirely unnecessary to some of you who have been associated with larger hospitals in the larger centers. I can assure you, however that these same rules are almost revolutionary in a great many hospitals scattered over the country I will mention just a few of these rules which have been adopted and incorporated into the by laws of various hospitals.

1 That the staff conference include a careful analysis of the results obtained in the hospital during each preceding month

2 That regular attendance at staff meetings be insisted upon, attendance being expected of all physicians who have had patients in the hospital during the preceding month

of
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hibited

4. That the case records be written within 36 hours after admission

5. That a history, physical examination record, and pre-operative diagnosis be recorded before operation (except in emergencies)

6 That no case record be filed until it is complete.

7 That every specimen removed at operation be sent to the pathological laboratory for a report.

8 That a system of laboratory charges be worked out which will allow every patient to receive adequate laboratory service

These rules are general and neither impede the initiative of any of the staff members nor hamper individual judgment. The announcement of a definite policy of this kind by a hospital is an expression of its endeavor to live up to its responsibility to the community

At the College headquarters we have various samples of staff rules and regulations adopted by hospitals in their endeavor to meet the standard. We will gladly send out these samples to any one interested

2 *Many hospitals require the attending doctors to sign a pledge or card, the latter often being known as the Physicians Registration Card Has this been found beneficial? What is the best form to use?*

DR. FREDERICK W SLOSE, Chicago In order that the physicians may clearly understand a hospital's policy it has become quite customary for hospitals to obtain the physicians signatures to the constitution and by laws. In other instances individual declarations are drawn up stipulating an agreement to abide by the rules and regulations of the hospital and a pledge against the practice of fee-division. In still other instances an individual fee splitting pledge is the only form used Cards are sometimes used to serve the same purpose

This procedure on the part of the hospital should not be viewed as derogatory to its staff members. Instead, it is a means of demonstrating to the community the hospital's endeavor to uphold a high standard of medical ethics and practice

The College has some of the forms which are used by the various hospitals in this connection and will gladly send them to any one on request.

DR. E. R SECORD Brantford, Ontario Just to provoke a little discussion I will say that we have no cards, no pledges, and as far as I am personally concerned, I am of the belief that he who desires to split fees or otherwise act in a way contrary to the standards that we believe to be proper will not be bound in any way by any mere signature attached to constitution and by laws,

of the hospital.

3 *In certain instances the attending doctors of hospitals have been found lacking in clinical interest What can be done to stimulate more interest in such cases?*

DR H J MOSS Brooklyn The question that we are discussing now seems almost unnecessary After reviewing the work of standardization of the American College of Surgeons this morning whereby each surgeon is expected to do the right thing by the patient in the matter of keeping records, it seems to me that this answer takes care of itself

In the first place, your staff should be appointed only for the period of a year and at the end of the year re-appointments should be made upon the work that each and every member of the staff did during the year If a record or inventory is kept

the particular surgeon has done during that given year You have then, at the end of the year your whole record of the total of infections, the number of deaths of that particular surgeon.

In other words you have an absolute inventory of everything that the man has done during the year Then if he has fallen short of the requirements, that particular man should not be re-appointed.

If you adopt that rule, I think you will not have to be concerned about the interest that each individual doctor shall take in his individual work.

A MEMBER I have found in hospitals the best clinical stimulus is the staff conference. In the

modern hospital the material that is discussed at staff meetings is a great stimulus.

4 *How often should the staff conference be held and what is the best form for it to take, a luncheon a dinner or an evening meeting? What should constitute the agenda for such a meeting?*

DR FRANK J JENNINGS Brooklyn As to the frequency of staff conferences we feel that that is largely a local matter Hospitals and staffs vary In the average general hospital which has on its staff a good many general practitioners, we feel that a meeting held once a month is to be preferred, and that it should be a convenient meeting the later in the evening the better, subject to certain limitations. I do not mean to hold it at midnight, but at 9 or 9 30, so that the man in general practice who has evening office hours has a chance to take care of his office or to make a call or two if he has to make it, and get to the staff conference.

In a small, closely controlled staff the weekly meeting is a splendid meeting as, for example at the Woman s Hospital at New York under the direction of Dr George Gray Ward. When a hospital is starting staff conferences and perhaps has friction or factional feeling to eradicate, a lunch or dinner may be the means of expediting or facilitating the starting of the conference.

Now, as to the ' agenda." For the successful formation of the staff conference, you must have a ritual if you are going to succeed. Doctors do not vary *much in temperament or character* all [illegible] and he is more or [illegible]

a staff conference committee This is composed of three members representing the different services in the hospital. It is very essential to have as chairman of that committee a level headed man who is a good presiding officer

In the development of conferences, the first thing that is a matter of attack is the record. You have heard described this morning and also this afternoon by Dr Slobe what a good record should contain There is no necessity for my going into that, but you will find that through staff conferences your records will steadily improve. At our last staff conference held at St. Catherine s, I think the strongest impression any one would take away was the high quality and excellence of our records.

Mortality we believe is properly a subject for review The records of those who have died are looked over and those which may point a lesson in any way are selected The man who is responsible for the case, abstracts the record and reports it. Now, that has a didactic value which to me is beyond criticism At the last conference a death from incision and drainage of an abscess of the thigh, secondary to osteomyelitis of the femur, was reported Just to show you the value of that particular report the patient had taken a general anæsthetic and had gone through a forty-minute operation when her actual surgical capacity should have reminded the surgeon to keep her in bed and to make a small incision only The lesson conveyed to them was that they should be on the lookout to see that they did not go beyond the limit of the patient s surgical endurance. And you can multiply that *ad infinitum* with consequent good first of all to your staff and, of course always to the patient

Morbidity, we believe, is a profitable and proper subject for review Reviews and analyses offer a field that is limitless.

In closing I may say that the staff conference committee has no rose strewn path to walk on They are the subject of criticism almost always allegations being made that certain men are being favored or that certain men through the conference committee are excluded from conference for one reason or other We have difficulties with the coterie which says that the whole thing is illegal so that what we have accomplished in holding staff conferences has been done at the expenditure of a good deal of energy and by overcoming a great deal of criticism

A MEMBER *A large number of hospitals review* three things the deaths, the unimproved cases the infections, and the complications, each month.

DR. R L. DICKINSON, New York I would like to speak of the Woman s Hospital Dr Ward runs one of the best staff conferences I have seen He begins with a brief presentation by the pathologist of interesting cases. Then he takes up the casualties man by man. Each man at the head of a service is asked to report for his service any deaths, any infections, any complications and any errors in diagnosis. Then the follow-up is taken up not each week but once a month Some interesting cases are taken up and the thing is a very live, keen, active meeting covering one hour

Another of our excellent reviews is on a different basis. I refer now to Dr Eugene Pool s conference in the New York hospital. It takes one hour Friday, at 12, his whole staff being present His conference is a little review of the staff itself They have their pathology at a

separate time. They go over their X ray work after lunch They take up the errors of diagnosis the follow-up work, and a general review once a month. They break up the meetings and that is very much better than running 3 hours on one afternoon or evening when everybody is tired out.

The great problem, I take it, is with hospitals open to many men. I recall one instance in a certain hospital—a doctor did not appear at a meeting, following the death of one of his patients

the rules and come and report his casualty his resignation would be welcomed.

5 *What is the best way to stimulate more consultations between members of the staff in hospitals?*

Dr. John Smith, Philadelphia Based on nearly 3 years experience with staff conferences, I would say that the answer to this question, how to stimulate more consultations between members of the staff in hospitals, is the clinical conference. What is needed is a feeling of kindliness and co-operation between the various members of the staff and various groups of specialists and there is only one way of doing that and that is through the clinical staff conference. I mean the general conferences as well as the group conference. The group conferences are important, but in order to get consultation you have to get a feeling of good-will and friendliness between the various groups, and a general staff conference is the only way to accomplish it.

In one hospital with which I was connected up to 15 months before we started the staff conferences, consultations were really rare. We started the staff conferences and before long the

only way that it can be done.

SECTION B—MEDICAL RECORDS

1 *Should not every medical man be responsible for seeing that a complete history is provided for each one of his cases whether public or private?*

Dr. M. T MacEachern I think the spirit of the question means that the physician either writes the record himself or sees that somebody responsible for a complete history in the light that I have explained? (Vote taken—large majority in affirmative.)

Dr. S G Davidson, Superintendent, Rockford Hospital, Rockford Illinois On this subject of records in the hospital, should the doctor be responsible for the records? Of what value is the record to anyone except the doctor, primarily? So why should he not be responsible for it? Every man knows that the value of the record to him and his patient lies in the fact that he can go back to those records 1 2 and 5 years, and study his cases and give his patients better service next year and better service this year than last. If they are not responsible, who is?

Mr. C A. Lindblad Superintendent, Buffalo Homeopathic Hospital, Buffalo New York I just want to give you a little experience on this subject. Our institution is an open hospital, but only repu

cians to do a little work Three months ago shortly after I assumed charge of this institution I wrote a personal letter to each man doing work in our hospital—and by the way there are some seventy five or eighty taking care of the private work—and asked each of the men sending a patient to the hospital to write his own histories or see that they were written. As soon as the patient is admitted to the hospital, the hospital statistician in charge of the record room prepares the history blank and mails it to the physician. This letter simply states that we would like to have him complete this preliminary personal history and the working diagnosis and return it promptly in the enclosed stamped envelope. This history can be prepared from his personal knowledge, by his office or clinical assistant, nurse in his office, or he can do it himself. This attempt was simply a try-out to see how it would work,

2 *What is the best way to secure operating-room records and what should they consist of mainly?*

Dr. Simon Tannenbaum, Superintendent, Jewish Hospital, Philadelphia This question naturally resolves itself into two headings, namely the records that are necessary or essential and the method of obtaining those records.

If I were asked to say briefly what those records should consist of, I would say that the record should consist of everything relating to the

patient from the time he is taken from his bed for the operation to the time he is returned to his bed from the operation

These records consist of three parts first, what is known as the record of the operating room second, the record of the anæsthesia and third, the record of the operation.

Now first, the record of the operating room is a big book which is usually kept in the operating room and consists of brief entries of the patient's name his location in the hospital, the operation

the record taken immediately beginning with the time the patient is removed from his bed and should contain first of all the record of the pre anæsthetic period—the pulse respiration, tem

anæsthetic used quantity used, the condition of the patient during the anæsthesia, giving fifteen minute record of the pulse and respiration, then the conclusion of the anæsthesia stating what the condition of the patient is including his pulse, respiration and temperature

The next is the record of the operation itself Now it may be a record on a sheet by itself or it may be apart of the general history That is a matter of choice. The record should contain the pre-operative diagnosis. That is one of the most important parts perhaps the most important part, of the record It should then contain a description of the operation describing step by step giving the source of pathology the organs explored stating whether they were normal or abnormal the closure, what ligatures were used and so on and a most important record not to be forgotten is whether drainage is left in the patient.

Now we come to the method of reporting the operation That is a matter of choice Some operators can dictate the operation during the operation itself Some of our very best surgeons do Others leave it until the operation is over It should, however be dictated immediately after operation giving in detail, as I said before every stage of the operation. It is dictated sometimes to the anæsthetist. It may be dictated to a stenographer who is there for that purpose. It may be dictated into a dictaphone, which does not require anybody's time and can be taken off at any time.

The question whether the report of the operation should be dictated by the surgeon himself or whether it should be dictated by the interne is one which is still open The educational value of having the interne dictate the operation is apparent. If the interne dictates it and it is then read by the surgeon, the interne will certainly be benefited a great deal by it.

Accurate records will very strongly show the character of the surgical work performed in any hospital. It will stare the surgeon right in the face and will show him how often he has been mistaken in his diagnosis and how often he has been right. And that is the kind of record I believe should be found in every hospital

DR M T MACEACHERN I think Mr Tannenbaum has covered the subject very fully On the method of reporting the operation he gives us first, the stenographer next, the dictaphone and last, the surgeon writing it. The most satisfactory seems to be dictation to a good stenographer

3 *What is the best procedure to keep accurate records of all postoperative infections?*

MR JAMES U NORRIS Superintendent, Woman's Hospital, New York At the Woman's Hospital we have a record form of a distinctive color and on it is recorded every dressing from the time of operation name of Doctor removing drain number of sutures, wound healing the promptness of union, condition of wound on discharge, list of dressings and character of dressing That is part of every history

4. *Who should be responsible for overseeing of the medical records as to completeness and quality?*

DR. F L ADAIR, Chief of Staff Swedish Hospital, Minneapolis, Minnesota A question of responsibility is involved in the answer to this question. And it seems to me that we should recognize responsibility of two kinds First, the collective responsibility of the hospital to the community as a whole. This involves the medical

physician to the patient cannot be taken over by the hospital nor can the collective responsibility of the institution be taken over by the physician. It may be assumed largely that both the institution and the physician are responsible for the completeness and quality of these records. The keeping and preserving the records is easily the function of the administrator of the hospital and can quite readily be taken care of by somebody It is merely checking of the different sheets, to see that they are present in the record before the record is filed away Administration is also re-

sponsible for the enforcement of this, because it is responsible to the public for the maintenance of these records as one of its functions and obligations to the community

The accuracy of the records cannot possibly be checked by the administrator nor by the historian or record clerk, whatever she may be called That must be up to the individual medical men No one else can be responsible for the accuracy of the records And it is better probably not to have any records than to have inaccurate records Of course, a certain amount of inaccuracies will creep in, but on the whole, if records cannot be depended upon for accuracy they are worse than useless.

The attending man or the visiting man who is responsible for the care of the individual patient must either supply the record from direct contact and direct history and examination of the patient or he must do it by proxy through a member of the house staff Either one of these might work out differently in different institutions In the last analysis, the enforcement of the accuracy of the record is not up to the hospital administrator but to the staff because medical men are the only ones competent to pass upon the fundamental accuracy of these records This is done as has been pointed out, through these monthly conferences, where the records are subjected to the scrutiny of medical men.

There is another point and that is the duplication of records where the physician keeps in his office complete records of the case, as any up-to-date medical man should, and when the patient goes to the hospital a record of the case should remain in the hospital This involves a certain duplication of effort and the cost of it comes back

become consolidated, so that, instead of duplicating records there is finally only one record and the work of the medical man becomes identified with the institution. It seems to me that that is at least one logical conclusion of this problem.

Dr. W A. Hausman Jr., Allentown, Pennsylvania I think it would be easier to bring about the writing of records if a rule were made that all cases must have their records complete before the patient can be operated upon. The provisional diagnosis must be made at the time of the examination of the patient and those records must be completed before the patient is operated upon.

As to the question which is up at the present time, at the Sacred Heart Hospital we have made it a custom for the chiefs of the departments to O K records at the completion of the case and each one of the records is gone over to see whether the record is there in its entirety We pay no attention to small errors or differences in diagnosis or things of that kind at the time, the aim being to see whether that record is complete or not The chief of the department goes over the same and passes it if it is correctly filled out. If not it is passed back and is not filed and is placed among the incomplete records until such time as it is corrected by the surgeon in charge.

Dr G E Follansbee Cleveland, Ohio I cannot agree with what the speaker has said about the responsibility for the record. Theoretically he is right but practically I believe he is wrong A

hospital as to their truthfulness unless those record are carefully gone over and minutely inspected with a suspicious eye by a competent record keeper or a man familiar with records.

This matter has come to my attention before and I have been somewhat interested in looking over the records in hospitals to see how well those records were kept, and I am sorry to say that in some hospitals with apparently satisfactory records, careful investigation revealed very untruthful records. I believe that the responsibility of a correct record belongs in the hospital and that there should be some one in the hospital, preferably connected with the staff and interested in the matter of records, a sub-officer of records, whose duty it shall be to go over those records with a fine-toothed comb. If we do that and then untruthful or unsatisfactory records are brought up we can get records that are of some value. But of what value, I would like to ask you, is an untruthful record in any hospital. You are better off without a record than to have an untruthful record.

Dr. Edward A. Weiss, Pittsburgh Pennsylvania We have found that the most satisfactory method of proving the record as to correctness and completeness is to have a committee of three from the staff Each man takes 2 hours a week and goes over the records in the record room and approves them if correct and then they are filed If incorrect or deficient in any respect, a note is made on that record and the individual member of the staff to whom the case belongs is

then called to the record room and required to complete it. If a blood count for example, has not been made he is required to write on that record why this was omitted, etc. This committee serves for 3 months only and then three other members of the staff are appointed No member of the committee is permitted to pass on one of his own records. This has worked very satisfactorily with us.

DR E A. SOMMER, Portland, Oregon I believe that the hospital ought to furnish a stenographer to take the record of the operation and place it on the history and then allow the surgeon to O.K. it.

SECTION C—LABORATORIES

1 *What laboratory work should a hospital of 75 to 100 beds provide as a minimum service?*

DR. M. T MACEACHERN To expedite matters I have distributed a little pamphlet covering this subject (sent on request)

2 *A hospital wants a routine pathological service in connection with their surgery How can such a service be financed?*

DR S G DAVIDSON Superintendent, Rockford Hospital Rockford Illinois How can such a service be financed? That is the main question We had that up this morning—the cost of the work. It was just brought up that we should have a stenographer in the operating room.

Laboratory work is admittedly one of the most essential in our hospital service And how can it be financed? Just how much laboratory work do the attending men want? What laboratory service should a hospital of 75 to 100 beds provide as a minimum standard? Why you want the best, do you not? You want everything you can have, don't you? And you want the tests made by the most competent laboratory people.

To answer the question, you have to group your hospitals into two groups the hospital in the small community and the small hospital in the large community where there are a number of other larger hospitals.

In the small community if the attending men in the hospitals or in that community will make proper use of the laboratory it is going to multiply its service over and over again every single month and there can be no question about financing it. Unfortunately it becomes necessary for every hospital superintendent, when he has established a first-class laboratory to begin to educate his attending men to make use of that laboratory I just had the pleasure this year of installing a laboratory in a hospital of one hundred beds in a community of seventy thousand people with two other hospitals, all small I think that is one of the crying disgraces—three small hospitals in a community of seventy thousand, with all their overhead with all their mismanagement, when any one hospital with the same number of beds could take care of all those patients and do it so much better

We installed a laboratory costing one thousand, five hundred and eighty-eight dollars equipment enough to take care of a hospital of three hundred beds or more, and we employed an excellent pathologist. We are paying him thirty five hundred dollars a year and 50 per cent of the net profits. Some of the medical profession felt that a pathologist was not worth more than from twenty three hundred to five thousand dollars At those figures we cannot expect men to take up that work. But when the medical men begin to wake up to the fact that that is one of the most important services we have they will begin to pay pathologists seven eight, or nine thousand dollars a year And then you are going to have good work done. We feel that our man would be able to earn at least six thousand dollars a year How do we finance it? We take the cost of the operation of that laboratory pro-rate it over our bed charges, and add 50 cents a day This enables us to give all the laboratory service that the attending men ask for routine analysis and so forth, anything that he wants is done and as much of it as is wanted. They do not have to ask the patient or tell him it is going to cost more. We figure on a basis of 30 per cent, which means 50 per cent for your smaller hospitals of 40 or 50 beds.

3 *How many hospitals are routinely putting through all the material removed in the operating room and thus checking up diagnoses?*

DR. M T MACEACHERN This calls for a show of hands. (Vote taken.) I am glad there are so many

Right here I want to tell you, you who are building new hospitals, do not forget to put your laboratory next to your operating room and your operating room where your pathologist is at your surgeon's elbow We have proved its value

4. *How can the pathologist arouse more interest in the clinicians and internes along laboratory lines?*

DR. A K. HAYWOOD Montreal There evidently must have been some reason for putting this question on the program and the reason is that the pathologist must arouse more interest

in the clinician and in the interne. If you will show me a hospital that is popular doing up-to-date work I will show you a hospital that has a keen pathologist. The pathologist must have a keen interest in the clinician. He must be able to come and decide with the clinician, not in a spirit of criticism but as a consultant in a spirit of helpfulness, and if you will apply that, you will find that in practically every obscure case your pathologist can be of inestimable value to the clinician. He doesn t examine merely for his own interest or for any financial gain. He examines more and more in his laboratory in order that he may be able to render some service to the patient. He must be confidential, he must be kindly disposed, his criticism should be softened with a certain amount of patience, he must make the interne welcome when he comes into the laboratory If he is going to arouse interest, he must make them feel welcome at all times to come into his laboratory and chat over obscure or ordinary

pathologist is a keen, tactful fellow-being he will attract the interne and the clinician to his laboratory In clinical pathological conferences, the pathologist in many cases acts as judge and jury He can commend and he can criticize, and it is

not offensive

All diagnoses should be made on every case in black and white and put down on the history and the pathologist should insist that the history gets to the postmortem room

A pathologist will very often forget that he is talking to students and to internes. He must be very guarded so as not to talk over their heads If the clinicians and internes have implicit confidence in the pathologist, if he is a tactful and kindly patholog t I do not think that he will have very much difficulty in interesting the clinicians or the internes in laboratory methods.

DR. MACEACHERN Dr Haywood brought out two points, the sending in of the various diagnoses by the clinicians and internes to the postmortem room and second, the pathological staff conference. On my way here I attended for a few minutes one of the conferences referred to at which the internes and the different members of the surgical service met the pathologist They meet every Friday morning to discuss the pathology of the week.

A MEMBER I know a great many pathologists and I know that they differ just about as much as do clinicians. So I believe that the only way to arrive at any conclusion is by hearty co-operation between the pathologist and the clinician Take any tissue that is removed. We have all had experience We send it to the laboratory and get a report. Send it to another laboratory and you will get a different report One of them is wrong Let us not lose track of this And let us remember that the laboratory and the clinician must work together

SECTION D—NURSING

1 *Can a hospital attain the minimum standard with what is considered an incompetent nursing staff?*

DR CHARLES H. MAYO Rochester Minnesota We are all interested in the care of the sick which has been greatly changed from ancient customs. The modern methods, proved to be the best, are now accepted by the public It is only a few decades since hospitals, some in truth hot beds of infection were looked on as places to die in a place of refuge especially for the poor They are now sought by the intelligent sick who desire the best possible care No one factor has brought about this revolutionary change The better knowledge concerning disease and its transmission and prevention, of the educated public who now demand more of the physician, has probably been the greatest factor in bringing about the reorganization the development of public education in hygiene will be the next great factor

The trained nurse has given nursing the human, or shall we say the divine touch, and made the hospital desirable for patients with serious ailments regardless of their home advantages. The rich patient who can pay the price the poor patient who can pay nothing may secure the highest service in sickness But how about the larger group of patients in the middle class, who neither rich nor poor would be glad to preserve their self respect by paying to the limit of their ability? The key note of hospital efficiency today on cor pitals institutions, unless they are supported from a bequest, they must be assisted by charity or by the city state, or some religious or similar organization to make up the yearly deficit Can a hospital give the minimum standard of care without the most efficient help? The answer is no" as opposed to public service and the support of

standards of efficiency Yet if the hospitals have competent physicians, surgeons, internes, superintendents, and trained chiefs of nurses with intelligent and willing undergraduates much can be accomplished to attain the minimum standard in a comparatively short time. The nursing and care of the sick is a matter of education, and ignorance may be overcome Knowledge is acquired by a compelling force from within, by desire or from without, by compulsion. No matter how efficient in general the nursing staff is the hospital will not be safe and truly serve the best interests of the sick without supervision by some one in authority This cannot be reversed the most competent nursing staff cannot replace those who are responsible for the direction or the administration of the organization

What can be done to maintain the efficiency and save the professional life and dignity of our nurses can we help them to help themselves? They are compelled to study and labor diligently for 3 years after having achieved a high standard of general education They are overtrained for nurses and undertrained for physicians. It is true that the training is good for them the greater number marry, and the wide general knowledge they have acquired is in fact, of more value to them, their children, and the communities in which they live than are college degrees, as it contributes to better national health and a more practical citizenship The records of St. Mary's Hospital in Rochester show that of the nurses graduating for the ten years preceding the last three years 1 per cent are dead, and 54 per cent are married. Of the class of four years ago, 31 per cent are married If then excluding the last three-year graduates, 2 per cent are out of the work, only 43 per cent are left in the service of the previous ten year period that has taken the nurses three years of hard, continuous study and work to learn as long in actual time spent as it takes to study medicine and three to four times as long as it takes to acquire a degree as osteopath or chiropractor It is evident that the foundation requirements are too high for the average demand, and in all fairness must be made a little higher by specialization, and by giving added responsibilities in positions as technical assistants, or the period of training must be shorter in conformity with requirements for ordinary nursing duty in order that a greater number may obtain the benefit of this educational training

The course of training should be two years with post-graduate study for the third year which should be optional, and it should be possible to take it at any time desired, so that those who remain in the work may fit themselves for the work in which there is greater opportunity for service and securing personal distinction Chief nurse in the hospital, chief surgical nurse, nurse in dressing service, anæsthetist county, city and school nurse, industrial and child welfare nurse, dentist's aid physician's aid, and laboratory technician are but a few of the many positions waiting It is far from my desire to destroy nursing standards, on the contrary I wish to advance them for those who remain in the profession with a demand for recognition of ability, responsibility, and honor which will then be accorded

The patient sends for the physician first. The physician secures a nurse if desired or he sends the patient to the hospital where a nurse in rotation is assigned by the superintendent. The physician or surgeon must assume the responsibility, even though death occurs from an accident in one

Any labor union in which the candidate draws pay or receives only board and lodging while in training as does the bricklayer, plumber, and carpenter, protects the job by limiting the number of apprentices. In professional life there is some danger in over-organization. The nurse, in accepting unionism, must carefully watch the policies of the organization that they be maintained along professional lines with their legislative efforts directed unselfishly to better care of the sick As a physician, I am proud that legislative acts sponsored by them with the one exception of that sponsored by medical anæsthetists, have always been in the interest of public health without thought of advantage to the profession The physicians services are always at command for charity which service the nurse cannot give.

In the interests of the sick I strongly advocate a return to the two-year course as a minimum standard of nurses training and the development of post-graduate work with a special diploma for advance training In urging this, I wish to call attention to the fact that in the Great War the medical department under the surgeon-general was developed to the highest efficiency by the valuable aid of the leaders of the department of nurses in Washington, and in the service abroad and at home. Most of the leaders in this group were themselves two-year graduates thoroughly capable and most devoted to their work.

It has been suggested that those who possess a high-school certificate should be graduated in two years from a course in general nursing and those desiring training in special branches continue or take such training at a later period In some

progressive cities such as Minneapolis, the theory of nursing with the fundamental branches is now given as a vocational training course with 6 months of practical work in a convalescent hospital in the public school system

2 *She*

and experienced graduate nurses?

Miss C. Lillian Clayton Director of Nurses, Bureau of Hospitals, Department of Health, Philadelphia, Pennsylvania Answering Dr Mac Eachern's question from the standpoint of the general subject of this afternoon s discussion my answer should be in the affirmative. Under graduate nurses should have competent and

To secure adequate graduate nurse supervision is one of the most important steps in efficient hospital administration. Supervision of under graduate nurses means much more than the words superficially imply It means the establishing and maintaining of proper professional relation ships between the administration and those supervised with the patients, the medical service and all departments related to the wards.

To do this successfully requires tact, ability education, and experience not possessed by the

of her own work.

Supervision does not mean interference with those supervised. It does mean however that the needs of those supervised must be understood and properly met. These needs are met because the supervisor's own previous education and experience have given her the proper background and her personality makes it possible for her to meet the needs of those supervised because of her own knowledge. In this manner she makes the value of the student greater

First, because she teaches her accurately to understand the work of the individual in relation to the work as a whole.

Second because her previous education and experience have made it possible for her to

to

embers

They

afraid. She does not evade difficult tas e pathol-

ferring them to others, or by leaving th

The student enters her work with much inter est and youthful enthusiasm This is priceless to the patient to the hospital, to society and to the nurse herself It must not be lost. It will be lost, however if she is not taught to use this interest and enthusiasm in the development of herself in her service. One of the great duties of the super visor is to direct these qualities into the proper avenues of self-expression

The supervisors form the necessary connecting link between the instruction received in the class room and its application at the bedside of the patient between hospital administration and co-operation, between medical science and its actual application when related to the patient. In other words, a supervisor is a teacher who helps She is the connecting link between science and art she keeps the balance between theory and practice.

3. *Nurses' records on patients in many instances are useless What are the essentials of such records and how can they be made of greater use?*

fact that most nurses records are useless, and therefore the real point of interest is why they are useless and what can be done about it. Too often the records are an expression of the opinions of the nurse and not an accurate statement of her observation of objective facts Furthermore, the facts noted are the least essential while the truly significant ones may be given a superficial and inadequate description. For instance, the mere statement that a patient had a pain in his side or suffered from a chill leaves unnoted the really important point as to the exact place and nature of the pain and the kind of chill.

Granting the unsatisfactoriness of the present situation, what are the elements considered essential for a complete nurse s rec Class who rather take for granted th be glad to preserve gives a graphic ov paying to the limit of their pulse, ?) The key note of hospital efficiency of th of any other great movement depending of ombined effort is organization So few hos pitals pay their expenses that like educational institutions unless they are supported from a bequest, they must be assisted by charity or by the city state or some religious or similar organi zation to make up the yearly deficit. Can a hos pital give the minimum standard of care without the most efficient help? The answer is "no as opposed to public service and the support of

not be matters of opinion but a careful description of facts

Such records will not be easy to procure as nurses as a rule are not articulate in words being chiefly expressive through their hands It is necessary therefore to consider whether it is important to have such records and if so how they can be acquired They really are of primary importance to the patient as they assure him of the most careful consideration of all that might have bearing on his case They should be essential to the doctor as developments might occur during his absence of which he cannot be aware except through the nurse s written record. She herself might not remember each significant detail unless she wrote it down. Furthermore, they are of importance to the doctor as a memorandum for future reference. The nurse also would benefit largely from such records as it would increase her interest in the patient and give added importance to her care of each case which would tend to make her more observant and have a tremendous educational value, helping her to correlate theory and practice, thus giving her a more intelligent understanding of her case. If these records are kept as described they should have a scientific value that cannot be overlooked and would contribute to the sum total of our knowledge of disease.

The real question is whether such records can be procured To my mind the answer is that they can and should be procured this, however presupposes a broad foundation. No nurse could keep such records unless she were possessed of a fundamental intelligence and a sound preliminary education, preferably 4 years of high school. Added to this she must have a scientific knowledge which will teach her how to observe. This in turn involves sound teaching during her nursing training In other words, the whole question of accurate nurses records which are the right of the patient and should be a necessity to the doctor or chiropractor is to a large extent the type of woman we must get and the kind of teaching requirements are too high for the [illegible] and in all fairness must be made a little by specialization, and by giving added responsibilities in positions as technical assistants, the period of training must be shorter in conformity with requirements for ordinary nursing duty in order that a greater number may obtain the benefit of this educational training

The course of training should be two years with post-graduate study for the third year which should be optional, and it should be possible to take it at any time desired, so that those who can furnish today And that hospital which recognizes these great obligations will lose no opportunity for acquiring equipment knowledge and the spirit to render it. Whether the nursing service is given by thoroughly trained and accomplished nurses or by a school of nursing which is an integral part of the hospital, it must be competent or the hospital does not meet its obligation to the patient. When the hospital is dependent upon its school of nursing for all or nearly all of the nursing care given to its inmates, it becomes necessary that the school shall have thorough instruction and competent supervision If all other things were equal, one would say, or at least naturally suppose, that the best instruction would be given in the largest general hospitals. But since they are not equal, the best

for the work, conscientiousness in doing it, and a spirit of humanitarianism manifested or at least possessed by the nurse caring for the patient, whether the nursing service is rendered by pupils or graduates, it must pass into good care. In those institutions where the nursing care has always been given mainly by the pupils or a school of nursing it has been the custom formerly to expect the most inexperienced beginners to undertake even complex work for the patients, who from the nature of their illness, should have had tender and skilful care and management. All that is now changed, it being the custom in those same schools to have the nurses made familiar with such procedures in the class room before coming in contact with the patients. This change is one of the blessings that have come out of the three years course, advocates of which believe that practices should be so often repeated as to be done automatically and almost perfectly before the patient is subjected to them, and not only is a patient's comfort an item for consideration in this connection but his safety also for when the nurse s routine practice is so nearly perfect, she need not concentrate her attention upon it but can keep her mind constantly upon the patient and his condition and thus often w[illegible]ct him from extreme weariness or even a cap[illegible] more serious situation that would really be noticed if she were absorbed by her

It [illegible] high-school [illegible] t should be given the best possible years from [illegible] hospital because first he needs it, and desiring to [illegible] use the hospital by becoming such has to take such [illegible] red to give it. So far as the individ

ual patient is concerned the purpose is that he may be cured. But so far as the physicians, interns, and student nurses are concerned there is an additional reason. That is, giving the care as thoroughly and scientifically as possible in order that other patients, future generations of patients anywhere and everywhere, may also have the benefit of their work. Besides the duty of the hospital in furnishing means for the possible cure of its patients, there is another duty it owes the public, and it may be classed under the head of prevention of the spread of disease To this end it must then so use and suit the materials found in its walls that it can make its contribution to the sick. No small part of the additional work incurred in these procedures necessarily falls upon the nursing staff and it must be prepared for its

It is believed, to recapitulate, that nursing service is best which contributes most to the ultimate recovery of the patient or when recovery is impossible, which finds the patient every available comfort. It is believed that the most satisfactory nursing is done in the larger general hospitals and in those of secondary size by students of a well-equipped, well-managed, and well-instructed school of nurses. The old hospital slogan that Nurses are created for the patients, must be amended to read for these and future patients, anywhere and everywhere, as well as for those whom we can help to avoid being patients. The nurses, therefore, must be trained to meet all such requirements, and 3 years are none too long for the purpose. It is the duty of the hospital to

school for nurses since suitable instruction in this as in all other forms of education requires time,

[illegible]

will have a stimulating effect upon the body of graduate nurses and nurse schools in all such institutions is firmly believed Especially will it be so in those institutions where the student body of nurses is given recognition as an educational factor and where the school is supported, as it should be by the hospital staff and community and standardization committee, all for the betterment of the sick.

or directions for their care and treatment. If standardization does as much for the schools of nursing as it has done for the hospitals, it will certainly be welcomed by the schools.

The greatest need in the suffering world today is for young women of good breeding of good education and of fixed principles of righteousness, which when added to good training will make an army that will be invincible before selfishness, negligence, and profiteering

Let the hospitals give them what they seek Let the community give them a place in it. Let them be honored let them be crowned with honor and the dearth of them will disappear

JANUARY 1922

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COLLECTIVE REVIEW

THE ETIOLOGY OF URINARY LITHIASIS

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THE phenomenon of the formation of calculus in the urinary tract has attracted the attention of medical men from the earliest times. In consequence, the hypotheses advanced to explain the cause of and the efforts made to treat and prevent the formation of stone have been legion. Hippocrates was the first to venture an explanation of the disease. He believed that waters containing certain varieties of mud and sand fostered the stone-forming process, he also emphasized the importance of inflammatory changes in the kidneys and bladder as essential factors. Schepelmann believes that the Father of Medicine appreciated the existence and importance of the mucoid binding substance in urinary concretions. Galen asserted that a relationship exists between gout and urinary lithiasis, and with him began the long train of efforts to establish a "crystalline uric acid diathesis as the forerunner of stone. This concept held sway especially during the latter part of the nineteenth century and it was during this period that the use of lithium salts as a "uric acid solvent" was much in vogue in the therapy of both gout and stone.

THEORIES OF THE FORMATION OF CALCULUS

In 1856 Meckel expounded the doctrine of a "stone forming catarrh" in which a low-grade catarrhal inflammation of the kidneys leads to the precipitation of certain elements of the exudate, with certain of the urinary salts, and thus the stone has its origin. But little was done experimentally until the middle of the last century In 1857, Rainey produced atypical bizarre crystals of carbonate, oxalate and phosphate of lime by precipitating these materials from media containing colloidal substances such as gelatin albumin, gum acacia, and mucus He suggested a relationship between such atypical crystal deposition and urinary concrements.

Ord and Shattock, in 1895 confirmed and extended the ideas of Rainey They showed that calcium oxalate usually crystallizes from water solutions as octahedra, but in colloidal media tabloid, dumb-bell, and spheroid forms were obtained An examination of the nucleus and body layers of calculi of calcium oxalate showed these to be composed of atypical crystals in many respects resembling the forms produced *in vitro* These crystals were such as might have been deposited in a colloidal medium and seemed to be fused together by an organic matrix. Fowler, in 1906, studied a series of calcium-oxalate calculi and came to similar conclusions.

Ebstein, in 1884 carefully analyzed calculi and proved the existence therein of an organic matrix. With Nicolaier in 1891 he reported an extensive series of feeding experiments using among other drugs, different derivatives of oxalic acid. They were surprised to find that one of the derivatives, the diamid of oxalic acid, commonly known as oxamid, on being fed to animals of different species, was excreted in the urinary

stream and in many instances formed concretions varying in size from yellow particles of sand to hard masses 1 cm in diameter Chemical analysis showed the stones to consist of oxamid plus an organic substance which Ebstein believed to be albumin He held that the desquamative catarrh and epithelial débris caused by the toxic action of the oxamid on the renal epithelium furnished the colloidal material by means of which the stone forming crystals were precipitated.

Tuffier in 1893 and Rosenbach in 1911 repeated the work of Ebstein with positive results Rosenbach found that partial or complete sectioning of the nerve or blood supply of one kidney or ligating one ureter was followed by a relative deficiency of excretion on that side, with an excess of excretion of the stone-forming material on the other

Schaede, in 1909 advanced the idea that stones are formed by the clotting of fibrinogen in the urine with the simultaneous precipitation of urinary crystalloids Fibrinogen according to Schaede, is an irreversible colloid or one which having passed to the state of clot or gel, cannot spontaneously return to the suspensoid phase, that is, the state of colloidal solution Schaede

lies in the fact that fibrinogen in demonstrable quantity is not usually associated with stone forming urine, while the rare instances of excessive fibrinogenuria, such as have been reported by O Conor have not been associated with stone. However there are rare cases of fibrin calculi, such as those reported by Gage and Beal, which might have such origin

Among other evidences of a chemical cause of stone are cited the occurrence of xanthin calculi

is, so far as we know no evidence of increased excretion of uric acid oxalate, or phosphate in the greater number of patients with stone. The relation of uric acid lithiasis to gout is much disputed and was denied by Virchow Bouchard reported

Moore, in eighty necropsies on gouty patients did not find evidence of lithiasis. However it is the usual textbook statement that gout predisposes to stone.

If stone is due to a local mechanism at work in the kidney then an increased elimination of uric acid or of oxalate or phosphate would probably enhance the chances of lithiasis by furnishing a more abundant supply of the material of which the stone is composed

Much has been written concerning diet as the cause of stone, but the evidence is inconclusive. High purin oxalate and phosphate diets have

a high vegetable diet, with high potassium and low sodium-chloride intake. Possibly the majority of writers continue to assail a high calcium intake as the cause of stone, in spite of the fact that our available pharmacological and clinical evidence is against such an etiologic factor

Calcification in necrobiotic tissues, metabolic errors, deficiency in oxidation, neuroses, sedentary habits, and the like have also been considered causal factors (124) Young (127) in Osler's System of Medicine, says that concentration of

due to sudden precipitation and compression of crystals while larger calculi result from deposition of crystalline material on small stones

Kuester and Rovsing have suggested that from uric acid infarcts in infants, crystals may form and being retained may lead to calculus deposition in later life Israel and Maas have pointed out that renal trauma is not infrequently followed by calculus, while Seefisch and Mueller have written extensively on the frequent incidence of calculus following spinal cord lesions.

The so-called anatomical or mechanical theories of stone formation are based on the relative frequency with which stones have been found associated with urinary stasis, diverticula, stricture, prostatic hypertrophy and other forms of obstruction. It has also been asserted that foreign material renal or extra-renal in origin, is the cause of stone, as a result of reduplication of surfaces and the increased opportunity for surface tension phenomena to come into play The significance of such association, which has been clinically established by the work of Rovsing Schenck, Hunner Braasch and Moore, Crenshaw, and others, will be considered in an experimental study soon to be published.

The bacterial or infectious hypotheses of the formation of stone are in part based on the demon-

stration of bacteria in stones and on the fact that the kidney associated with stone is almost always infected The clinical relationship between carbonate and phosphate calculi and urinary infection has been emphasized particularly but it must be borne in mind that the infection has supposedly brought about the deposition of stone by changing the reaction of the urine and not necessarily by other means For this reason the urate and oxalate stones have been considered usually as non bacterial in origin.

Within the past few years Rosenow has developed the doctrine of elective localization and specific activity of bacteria He has been able to produce cholecystitis and cholelithiasis experimentally by the intravenous injection of bacteria obtained from the gall bladders of patients with gall stones. He has suggested that specific infection may likewise be related to urinary lithiasis. Charles H. Mayo has suggested that urinary calculi are formed by the secondary invasion of a previously established low-grade pyelonephritis by specific stone forming bacteria.

Recently Meisser and Braasch have produced alkaline phosphatic cystitis and urinary concretions by applying Rosenow's specific bacteriological methods. This is an important step forward and is probably the best existing evidence that specific bacteria are related to the process of stone formation.

THE PHYSICO-CHEMICAL FEATURES OF URINARY CONCREMENTS

Albarran divided calculi into those unaccompanied by infection 'primary calculi' and those which appeared clinically to be due to infection, secondary calculi. The primary calculi included uric acid ammonium and sodium urate, calcium oxalate which formed in highly acid urines and also calcium phosphate (crystalline) and calcium carbonate (crystalline) which formed in alkalin urine whose reaction was not due to infection or in urine faintly acid or neutral. The rare calculi of cystin xanthin indigo urostealith, and fibrin were also considered primary Secondary calculi were found in alkalin urine whose alkalinity was due to the conversion of urea into ammonium carbonate by so-called urea-splitting organisms. These included therefore, ammonium magnesium phosphate and the calcium phosphates and carbonates of the amorphous varieties.

VARIOUS CHEMICAL TYPES OF CALCULI

Clinically there is no uniformity of opinion as to the relative occurrence of the different chemical types of calculi Thomas [illegible] of Mayo Thompson bibliography leads us to believe that the variation of opinions is due as much to the fact that no one observer analyzes a sufficient number of stones from which conclusions may be drawn as to the discrepancies in technique

Calcium oxalate uric acid and urates, phosphates and carbonates in the order named appear to be the most frequent constituents, the vesical calculi of India and China seem to be mostly of the urate and oxalate variety It is said that uric acid predominates in Europe and oxalate in North America (18) Kahn and Rosenbloom believe that calcium oxalate composes the bulk of most stones and that uric acid is present for the most part in traces, seldom in amounts over 10 per cent. A few of their stones contained slight amounts of phosphorus.

Most authors consider the nucleus of the stone to consist of ammonium urate in infants of uric acid in young adults, and of calcium oxalate in older persons. Renal stones from patients of all ages are likely to contain more oxalate while vesical calculi are chiefly composed of uric acid and phosphate. Carbonatic stones, while common in the lower animals, are rare in man although minute amounts of carbonate are often found.

Many stones are layered, the layers consisting not infrequently of different chemical constituents, either pure or mixed A phosphate-carbonate layer may alternate with an oxalate urate layer This feature has been explained as due to a change in the reaction of the urine during the time of the formation of the stone the phosphate-carbonate layer precipitating while the urine is alkalin and the oxalate urate layer precipitating while it is acid Layers of oxalate may alternate with layers of urate and here again differences of hydrogen ion concentration or of colloidal relationship have been used to explain the cause.

FACTORS DETERMINING THE SHAPES ASSUMED BY CALCULI

The shapes assumed by calculi is believed to be determined largely by the site of the development of the stone. Thus, small calculi lying in the minor calices, usually have the contour of the calyx and larger 'staghorn' stones may uniformly follow the pelvic outline. However jackstone and mulberry varieties of the oxalate stones are difficult to explain on such a basis. Their shapes may possibly be due to internal molecular forces which came into play during their deposition and growth

THE MICROSCOPIC STRUCTURE OF CALCULI

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stones seem to be composed of crystals microscopically atypical in size and shape from the usual crystals of similar chemical composition found in voided urine. These crystals are fused together with a matrix of organic material, often pigmented in clefts and interstices. Most stones show a tendency to lamination and radial striation. Certain earthy phosphates precipitate from faintly acid or neutral urine and consist of large crystals macroscopically distinct and only partly fused. These show no lamination. In pure phosphatic calculi, firm amorphous material is fused and the lamination is also absent. Young holds that the nucleus of urate and oxalate calculi is not laminated but the outer layers become concentrically striated as they are deposited. Cystin calculi are not laminated although they may attain large size. Typical or slightly atypical hexagonal crystals are fused in a waxy mass.

SIGNIFICANT CLINICAL FEATURES ASSOCIATED WITH CALCULI

Stones occur more often in males than in females, the ratio being two to one in the Mayo Clinic series (12) They recur in less than 10 per cent of cases after their removal at operation where fluoroscopy and later renaying fail to reveal fragments which have been overlooked. [illegible] forming kidney

kidneys, formerly the site of large branched stones, is not uncommon Renal and ureteral [illegible]

about equally involved. These clinical features are strongly suggestive of a local stone forming process at work in the kidney the ureters, or the bladder

CONDITIONS UNDER WHICH URIC ACID URATES, OXALATES, AND PHOSPHATES ARE DEPOSITED FROM URINE

The most common constituents of calculi are oxalates, urates, and phosphates. Uric acid, calcium oxalate, calcium phosphate and ammonium magnesium phosphate are practically insoluble in neutral distilled water They are the most

uric acid, 0 015 gm. of oxalic acid, 2 5 gm. of phosphoric acid, and 0 25 gm of calcium are eliminated every twenty four hours. These insoluble substances are held in solution in urine to a far greater degree than in water This property of urine to hold uric acid and calcium oxalate and phosphate in solution has been attributed by most physical chemists, including Schaede, Bechhold, and Lichtwitz, to the presence of so-called protective colloids (Schutzkolloide) For example, Lichtwitz has shown that the extraction of colloidal material from the urine by means of benzin will result in the immediate precipitation of phosphates. On dialyzing the urine against water the urinary crystalloids were found by Lichtwitz *to pass into the water and to be precipitated.* The precipitate consisted chiefly of calcium oxalate.

URIC ACID AND URATES

Uric acid is deposited in acid urine in several forms. It is believed to be present in solution as the monosodium salt. Monosodium phosphate, however tends to take the sodium from sodium urate and is thereby converted to disodium phosphate. The uric acid thus formed is comparatively insoluble. Hence, a high percentage of acid phosphates will tend to lower the solubility of uric acid, while the neutral phosphates will tend to increase its solubility Sodium chloride

above $P_H 7$

OXALIC ACID AND OXALATES

According to most authors, oxalic acid owes its presence in the urine to incomplete oxidation of uric acid or of carbohydrate. Others believe it is formed in the stomach by carbohydrate fermentation In excessive oxaluria it is assumed that this deficiency of oxidation or fermentation assumes a pathologic degree, although some authors attribute the condition to lowered urinary *acidity claiming that the excretion of oxalate is* not actually increased. A dietary or exogenous source of oxalic acid in the urine depends on the ingestion of certain foods, such as rhubarb and spinach It is extremely doubtful if such a diet can have more than a remote influence on calculus production The precipitation of calcium oxalate takes place best in faintly acid urine. It is also

to increase its solubility In any crystalline oxaluria the limits of solubility of the calcium oxalate have been reached and discrete unfused octahedra separate and are passed in large numbers. Calculi are seldom found under such conditions.

PHOSPHATES

The phosphates in urine are largely from exogenous or dietary sources. Only 1 to 4 per cent come from the disintegration of body tissues. Calcium and magnesium phosphates may be deposited in faintly acid or alkaline urine while triple ammonium magnesium phosphate is deposited usually in infected alkaline urine. The experiments of Lichtwitz seem to show that colloidal material is necessary in order to carry them completely in solution The urinary reaction, however is equally important, and again many authors attribute the phosphaturia seen in debilitated persons to lowered urinary acidity rather than excessive secretion of phosphates. We have found no statistical evidence of an unusually high incidence of phosphatic calculi in phosphaturia.

CALCIUM AND MAGNESIUM

The calcium and magnesium metabolism is of interest in relation to the "water theories" of stone. The daily urinary output of calcium is about 0 1 to 0.4 gm expressed as calcium oxide. By far the greater part of the calcium in health is excreted from the bowel. Intravenous injections and feeding of calcium salts do not materially increase the calcium content of the urine (20, 23, 125), as most of the element is excreted through the intestine. In states of low calcium content of the blood and tissues an excess absorption may take place from the intestine, but with a normal calcium balance in the body an increased ingestion of calcium will not lead to a marked increase either in the blood or in the urine. An increased ingestion of magnesium salts leads to an increase of calcium in the urine the converse is also said to hold true.

Magnesium is eliminated to the extent of 0 1 gm to 0 3 gm. each day, expressed as magnesium oxide Its amount depends on the diet. Fifty per cent of magnesium ingested passes through the kidneys, the remainder through the intestines. So far as we know, disturbances of magnesium metabolism are unrecognized in pathology

CYSTINURIA AND CYSTINE CALCULI

Cystinuria is an error of metabolism which is inborn and hereditary (34, 43, 125) Males seem to be affected by the disease twice as often as females. Cystin is the amino acid which contains the sulphur of the protein molecule. It is ordinarily destroyed in two ways by conversion to taurin and then to taurocholic acid, which is excreted in the bile, and by oxidation to sulphates, which are excreted in the urine. In cystinuria this mechanism seems to be interfered with, probably more in the oxidation to sulphate than in the conversion to taurin. In consequence, large quantities of cystin find their way to the urinary stream, when they are carried in solution if the urine is alkalin, an acid urine, however precipitates the cystin as colorless hexagonal plates. Cystinuria is often associated with cystin stones, in most instances the calculi first attract attention to the condition It is difficult to know how often cystinuria is unaccompanied by calculi. As cystin crystals are precipitated only in acid urine, many cases of alkalin cystinuria may be missed even if the urine is examined microscopically The familiar occurrence of cystinuria may be one of the explanations of the relatively few cases of calculus in family groups (98, 78 9) Cystin calculi may be pure in chemical composition but more commonly they contain other substances, especially calcium phosphate. Cystin calculi are recommended in cases of cystinuria as alkaline urine dissolves cystin and thus prevents the formation of stones.

XANTHINURIA AND XANTHIN CALCULI

Xanthin is a normal urinary constituent. It is the most abundant purin base present. It is always soluble in normal persons, the appearance of xanthin crystals in the urine being considered an evidence of a pathologic condition. However, the nature of this crystalline xanthinuria is a matter of total ignorance. The condition is very rare. Xanthin is often mixed with uric acid calculi and is rarely found as the chief constituent of stones. Rosenbloom collected six such cases from the literature and reported a seventh of his own.

RARE TYPES OF CALCULI

Fatty stones (urostealiths) have been occasionally described. Their source and chemical composition are veiled in obscurity and we have found little literature on the subject. Horbaczewski analyzed one such specimen and found protein, fatty acids, and neutral fats to be the chief constituents.

Cholesterol calculi have been found in rare instances (125), but the cause is utterly unknown Horbaczewski found one such calculus in a patient who had had cystin calculi.

Fibrin calculi occur infrequently They appear to consist of alternating layers of fibrin and calcium phosphate and are associated with repeated attacks of hematuria, the nature and cause of which are obscure The review of the subject by Gage and Beal is interesting Possibly it is in such cases that Schaede's hypothesis of the formation of the calculi may find an application

THE GEOGRAPHIC DISTRIBUTION OF URINARY CALCULI

No investigation of urinary calculi is complete without consideration of their geographic distribution. An analysis of the literature shows that the conceptions of the present day are based largely on the work of Hirsch and several more recent contributions from Chinese and Indian sources. The data are drawn chiefly from hospital statistics, mortality records, and the experience of individual practitioners. Naturally data from well-organized hospitals with properly tabulated case records and necropsy protocols are most valuable Mortality statistics are based chiefly on death-certificate reports and are likely not the primary cause of death also renders such data unreliable. However on a large scale, mortality records may be of value. The experience of individual physicians contains so much of the personal factor that this seems the least reliable source of all.

According to most observers, the formation of calculus is uniformly high in Holland, Syria, Lower Egypt, Persia, Italy Morocco, and Algiers. The rarity of the condition in Iceland, Norway Sweden, Denmark, Finland, Northern Russia, Germany (except endemic) Ireland East Indies, West Indies, East Africa, Central Africa, West Africa, Nubia, Tunis, Polynesia, Australia, British Guiana, Uruguay Peru, and Nicaragua has been emphasized by practically all writers on the subject, most of whom quote Hirsch's observations

Urinary lithiasis seems to be endemic in certain localities, often circumscribed within narrow geographic limits. Among such localities are the Canton province of China (extremely high) the Punjab and interior upland districts of India, Arabia, Germany (Altenburg has a high incidence within a radius of sixty miles old Bavaria, and certain Alpine districts) England (Norfolk, Bristol, and other isolated areas) Scotland, Italy (especially in Brescia and Cremona) Mexico (Oaxaca) France and Central Russia (a very high incidence in the region around Moscow)

The relationship of the soil and water to the incidence of stone has been studied only superficially Areas in which stone is of frequent occurrence and limestone is plentiful are the basins of the Don and Volga, the eastern coast of Eng

abundant constituent of the soil e g, Canton Province of China, the Island of Mauritius, Indian districts, the Duchy of Altenburg and Lorraine. Certain limestone areas in which the inhabitants are notably free from stone are the West Indies, the Barbados, Western Switzerland, many parts of England and America, and the limestone districts of India In this connection it may be noted that in the Alpine districts in which limestone and calculus are coincident most of the natives drink rain water from cisterns

Frederick L. Hoffman, of the Prudential Insurance Company has carried out an extensive investigation[1] of the geographic data for the United States A careful study of his tables reveals an increase in the recorded death rate from urinary calculus within the last two decades There is a certain definite variation among the states, a tendency to parallelism, in many instances, between deaths from biliary and urinary calculus, and an increase in the mortality with the advance of age.

On the whole, a study of the literature leaves us dubious with regard to the geographic element in the cause of stones The tendency to formation of calculus in limestone regions, in cold, warm, dry damp tropical, or temperate countries is not clear It seems that the extremely cold regions of the far North are peculiarly exempt and that certain districts, particularly China and India, are more liable to this condition than others.

RACE

Racial differences seem to play little part. The Jews of Northern Germany Christians in the Balkan States, and Italians in America are accredited with a high incidence The negroes have long been considered exempt, but Hoffman's tables throw new light on this statement. They show

[1] Dr Hoffman's work is soon to appear in the International Journal of Public Health, Geneva, Switzerland

that the mortality from urinary lithiasis, in this country at least, is about equal in the two races

HEREDITY

The familial incidence of cystin calculi has been mentioned. Some authors ascribe uric acid calculi to a familial tendency but it is to be feared that their conclusions are drawn more from the hereditary nature of gout than of stone.

AGE

The greatest discrepancies of opinion occur with regard to age. Various writers consider children almost exempt, while others hold that *the incidence in this group is extremely high* The age of greatest occurence as judged by time of operation, is in the second, third and fourth decades. Below ten years and above fifty years the incidence is much less. However, the condition may occur at any age. Thompson, reporting 3,492 operations for calculus (almost all vesical) in the Canton Hospital found 43 per cent in males under 20 years 41 per cent in those from 20 to 50 and 14 per cent in those over 50 Only 2 per cent of his patients were females.

SUMMARY OF CONCLUSIONS FROM AN ANALYSIS OF THE LITERATURE ON THE ETIOLOGY OF LITHIASIS

1 The problem of the formation of calculus is one of chemical precipitation We must endeavor to discover what mechanism causes urates, oxalates phosphates, and so forth to be precipitated in a manner to cause fused hard concretions rather than individual crystals to maintain their state of isolation in their passage through the urinary tract. Whatever mechanism is at fault, we are certain that the veracity of this statement will remain unaffected

2 Differences of reaction as determined by the hydrogen ion concentration and qualitative and quantitative changes in the colloidal materials of the urine, such as pigments mucin, nebecula, albumin and nucleo-albumin have been shown to influence the nature of urinary sediments both chemically and physically The microscopic and gross features of calculi seem to show that an abnormal variation of these factors is at work in the formation of stone.

3. Geographic distribution, race, heredity age, diet, sex and trauma seem to offer little suggestion with regard to the cause of concrements. If factors at all, they are probably of secondary importance.

4. The three commonest diseases associated with a visible increase in the crystalline content of the urine, that is gout, oxaluria, and phosphaturia, are found far more frequently without calculus deposition than with it. Many authors have assumed that there is a high incidence of lithiasis in such diseases, but have offered little or no statistical evidence in support of their views

Xanthinuria and cystinuria are undoubtedly necessary to the formation of xanthin and cystin stones but how often patients with xanthinuria and cystinuria escape calculus formation is problematic.

5 On the whole, the clinical evidence of the cause of stone points to a local mechanism at work in the pelvis of the kidney or in the bladder The frequent occurrence of demonstrable foci of infection in patients with calculi and the almost universal finding of infected kidneys and bladders associated with stone lend, tremendous weight to the idea of a specific stone-forming infection It is conceivable that at times excessive excretion of crystalloid material may reach such a degree that the normal protective ' colloids of the urine cannot handle the extra burden Under such conditions calculi may form Likewise, it is possible that qualitative or quantitative changes in the urinary colloids may occur without bacterial infection Such changes may lead to the formation of concrement, even though the urinary crystalloid excretion remains within normal limits.

6 There is little direct evidence that anatomical factors or stasis can initiate the stone forming process but their frequent association with calculus makes it seem likely that the stone-forming mechanism may work to better advantage under such conditions.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Imbert L.: Remarks upon Autoplasty (Notes d autoplastie) *J de chir* 1921 xviii, 113

The fundamental difficulty in all plastic skin operations is the maintenance of the nutrition of the flap Success in overcoming this difficulty depends upon many anatomical and mechanical factors in addition to general conditions which influence the vitality of the transplant.

Two vascular plexuses run parallel to the surface of the skin. The deep plexus which is derived from the subcutaneous tissue, is connected with the superficial plexus by a number of very fine vessels. The area of skin between is rather poorly nourished. *The transplant must therefore include the entire* thickness of the skin. The ideal technique consists in dissecting the flap in the direction of the arteries but this is often impractical

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the surrounding tissues. Consequently it is rational to direct the pedicle in accordance with the general circulation of the particular part of the body under consideration. The width of the pedicle must depend upon the abundance of vessels which course within it. The narrow highly vascular pedicle is very well exemplified in the frontal transplant which may be obtained for a rhinoplasty In the majority of cases however the surgeon must depend upon vascular anastomoses from the surrounding tissues. The surgical problem therefore is how large a flap may be successfully nourished by a pedicle of a given size but it must be remembered that the ultimate vitality of the flap does not depend solely upon the mechanics of the circulation as thromboses

disinfected and all scar tissue must be thoroughly removed before the flap is applied. The author has found that the results are more often successful when the angle of torsion of the pedicle is between 45 and 135 degrees.

Imbert does not free the pedicle until at least seventeen days have elapsed. The usual interval is twenty to twenty-one days The sectioning is done under local anæsthesia. At times it is best to do it gradually at two or three sittings as this makes it possible to judge the vitality of each portion of the flap cut away

The author s results with homoplasty have been uniformly poor even under the most favorable conditions. LOYAL E DAVIS M.D

Costantini H : The Value of a Combined Incision in the Abdomen and Thorax in the Surgical Exploration of the Left Hypochondrium (Valeur de l'incision combinée de l'abdomen et du thorax dans l exploration chirurgicale de l'hypochondre gauche) *J de chir* 1921 xvfil 130

The operative technique described by the author permits wide exposure of the left hypochondrium without the risk of creating a pneumothorax or the

acutely flexed upon the trunk. A transverse incision from the midline at a point midway between the xiphoid process and umbilicus is made to the tip of the left tenth costal cartilage The abdominal cavity is entered and the tips of the first and second fingers of the left hand are introduced. With these fingers the lateral wall of the diaphragm is held firmly against the ninth and tenth ribs

A lateral skin incision is then made following the course of the ninth intercostal space down to, and exactly dividing the intercostal muscles The cartilage between the anterior extremities of the ninth and tenth ribs is removed A through-and through running suture is then introduced through the upper edge of the divided intercostal muscles and the diaphragm and another through the lower

course extremely important to hold the diaphragm against the chest wall as tightly as possible until this latter step is completed.

The diaphragm is then incised between the lines of suture and the field of operation is exposed. Closure is effected by bringing the diaphragmatic edges together The line of suture is further strengthened by approximating the ninth and tenth ribs.

This operation is indicated in cases of thoraco-abdominal wounds which have a thoracic wound of entry for diaphragmatic hernia, tumors in the left wounds in the an abdominal case pneumo- ision described

allows thorough treatment of the diaphragmatic wound and complete exploration of the abdominal viscera LOYAL E. DAVIS, M.D

Robineau M Suture of the Intestines (Les sutures sur le tube digestif) *Presse méd* Par 1921 xxix, 72

In the usual intestinal anastomosis a small dead space is left between the sero-serous and the sero-muscular layers of sutures This fact is well illustrated when the stump of an appendix is ligated and invaginated by a sero-serous row of sutures In his own cases and those of others the author has observed the formation of a small abscess in this dead space following the escape of intestinal contents through the perforation of a through-and-through suture

muscular edges are united The mucosa is then incised and the posterior edges are sutured. In the next step the anterior edges of the mucosa are brought together and lastly the anterior musculo-serous edges.

This method is particularly efficacious in gastric surgery and for lateral anastomoses of the intestines. The author has never seen the formation of an abscess or fistula following its use

LOYAL E DAVIS, M D

Culbertson C.: Use of the Sigmoid Flexure and Cæcum in Pelvic Peritonization. *J Am M Ass* 1921 lxxvii, 772

The problem of disposing of raw areas resulting from peritoneal adhesions is discussed with special reference to the variety representing suppurative processes in the pelvis and lower abdomen Transplantation of peritoneal or omental grafts is perhaps the best method for a small area of raw surface that must necessarily remain exposed The ideal operation on the pelvis when raw areas are produced leaves none but smooth peritoneal surfaces throughout

In the author's opinion it is freedom of the ileum from postoperative involvement that is most desired as it is such involvement that is the cause of most of the distress. Intestinal obstruction due to involvement of the sigmoid flexure is seen more commonly in cases of malignancy than in cases of inflammation.

If the ileum is involved it must be freed and peritonization must be effected by means of omental or peritoneal transplants The sigmoid flexure, however is capable of functioning when there is at least relative immobilization, and the best way to keep the ileum out of the pelvis is to block off the true pelvis entirely This is accomplished by using the sigmoid and rectum alone or with the cæcum on the right side after the appendix has been removed Infiltrated and raw areas present on these structures are rolled under by the same procedure.

Instead of trusting to the sigmoid flexure to become adherent, as Kelly suggested, its adhesion is brought about directly and the place of its adherence is definitely determined In a case of generalised peritonitis due to bilateral salpingitis in which the tubes and uterus have been removed the ovaries being left *in situ* the technique used is described as follows

If the sigmoid flexure has been adherent over the

From this point on, the right pelvic wall and sigmoid colon are brought into peritoneal approximation as was done on the left side until the shelf of the pelvis is reached when the suture passes from the sigmoid to the rectum and is continued, uniting the rectum with the posterior peritoneum as far as the point where the rectal peritoneum is reflected, approximately just to the right of the promontory of the sacrum

appendices epiploicæ are absent as a result of

accomplished in the mid-pelvis where the vesical peritoneum is brought into use as here flexibility is greater and tension less.

In 518 cases the sigmoid was absent only once and rarely is it too short to cover unusually extensive raw areas. In the latter case the cæcum may be

method has been used after total hysterectomy thirty two times, after subtotal hysterectomy 122 times, after fundal amputation of the uterus 180 times, with round ligament shortening three times, and without hysterectomy five times. The sigmoid was brought up over the bladder twenty-four times and the cæcum was brought in to cover the right pelvic wall twenty-eight times An omental graft to cover infiltrated areas of the ileum was employed twenty-eight times.

is decreased in size by fundal amputation. In the majority of the operations the indication lay in pelvic peritonitis but the procedure has been found useful also after operations for uterine fibroma, carcinoma, tubal gestation, and ovarian cystoma Drainage following this type of operation is unnecessary N K. Forster, M.D

SURGERY OF THE HEAD AND NECK

HEAD

[illegible]-Auricular Fistulæ (Plastik retroauikaltrepanationen)

When an opening of considerable size surrounded [illegible] operation and large depressed treatment, the author uses the following double-flap method

After excision of the scar and freshening of the margins of the fistula, a skin and muscle flap is formed from the upper third of the sternocleidomastoid muscle with its base upward. On the lower end of the flap a disc of skin is cut somewhat larger than the depression containing the fistula which is to be covered and the skin of the rest of the flap is dissected away The flap is then turned upward so that the disc of skin lies directly upon the fistula. This skin and muscle flap which lies with its raw side outward, is then covered with a second skin flap with its pedicle posterior to the first flap which is cut around toward the neck, turned up over the first flap and fastened with a few stitches. Primary closure of the skin defect on the neck is effected by mobilization of the skin. Kredl (Z)

Ravenchon L. Worms, G. and Rouquier: Trau[illegible]

neris craniens) [illegible]

The authors report the clinical history and age [illegible] ight [illegible] t the [illegible]toms left the [illegible]plete paralysis of the facial nerves on the right and left sides and of the motor division of both trigeminal nerves, and complete anæsthesia in the area supplied by the ophthalmic division of the left trigeminal nerve.

Sensibility to all types of stimulation was diminished over the supply of the maxillary and mandibular divisions of both fifth cranial nerves, the decrease being more marked on the left side. The sensory changes also involved the mucous membrane of the nose and mouth. With these changes in sensation there was a bilateral diminution in the corneal reflexes and corneal ulcerations which were more marked in the left eye. Vision was diminished in both eyes but there was no hemianopsia. The auditory nerves and the tympanic membranes were normal. There was bilateral paralysis of the abducens nerves resulting in an internal strabismus.

During the last two months preceding his entrance to the hospital the patient had suffered a marked loss in weight and had had polydipsia and polyuria. His mentality had degenerated his memory had become poor and he was unable to fix his attention.

Roentgen ray examination of the skull showed an increase in the size of the posterior clinoid process of the sella turcica due to a marked irregular callus formation continuous with a well-defined fracture of the posterior wall of the sella turcica.

The patient suddenly succumbed to cardiac exhaustion accompanied by deep coma. Autopsy showed a transverse fracture extending from one middle cerebral fossa to the other and through the base of the posterior clinoid process. Over the line of the fracture the dura mater was very adherent while the pia mater and arachnoidea were greatly thickened.

The pituitary gland was unrecognizable as such having been replaced by a small nodular mass enclosed in a dense fibrous capsule. Histologic examination disclosed the presence of fibrous tissue poor in cells but no hypophyseal tissue. There were no gross interruptions in any of the cranial nerves although the fifth sixth and seventh nerves were very soft and friable. The gasserian ganglia and especially the left one, were very adherent to the cavum meckelii, atrophied and grayer in color than normal.

The cranial nerve lesions could all be explained upon the basis of a meningeal hæmorrhage following the fracture. The interesting question arises, however as to whether the symptoms of diabetes insipidus which were undoubtedly present were due caused symptoms of diabetes insipidus by the production of irritative lesions close to the pituitary gland.

The authors compare this case with an earlier case reported by them which was characterised by the syndrome of adiposis genitalis with bitemporal hemianopsia optic atrophy and marked enlargement of the sella turcica. This patient gave a history of

a severe head injury some months previous to the onset of the symptoms X ray treatments influenced the clinical course of the condition very favorably

The authors believe there is a direct relation between trauma and the development of certain hypophyseal neoplasms Their two cases illustrate entirely different types of hypophyseal destruction In the first case the trauma destroyed the gland directly while in the second case it contributed to the onset of a benign hypophyseal neoplasm

Loyal E Davis M D

Baehr E. M : Tumors of the Corpus Callosum. *Ohio State M J* 1921 xvii, 626

Baehr presents a brief preliminary study of tumors

brief time. The following day he was well enough to return to his office Before the week had elapsed he had become confused, disoriented and out of touch with time and events His mental state was a rather rapidly advancing soporific stupor with loss of all spontaneity and interest which was accompanied by an expression of confusion and daze He was docile and obedient, knew his family and for a few days answered questions

Physical examination revealed no abnormalities except difficulty in defecation and loss of bladder control The blood pressure was 120 mm and the discs reflexes, and urine were normal

In the course of a few weeks the patient became more and more stuporous and died without ever having paralyses or convulsions

Postmortem examination of the brain disclosed a large spongy tumor confined strictly to the corpus callosum and symmetrically distributed extending bilaterally over the striate bodies into the white substance of the frontal lobes There was complete destruction of the corpus callosum Microscopic section showed the growth to be a small round-cell sarcoma

A review of the reported cases indicates that the chief difficulty in diagnosis was due to the symptoms caused by the extension of the tumor and pres-

(4) absence or infrequency of impairment of the

all cases progressive loss of spontaneity well defined memory disorders, interruption in the normal sequence of ideas, and loss of discrimination but conservation of intelligence until late in the course of the process. The author offers a briefer syndrome than Bristowe's, as follows. (1) disorders of intelligence of the type described (2) absence or insignificance of signs of increased intracranial pressure, (3) absence of definite evidence (Kennedy's signs) of tumor of the frontal lobe and (4) absence of paralytic or convulsive phenomena until, as the result of encroachment, motor and sensory pathways or the cranial nerves are affected. J J Lissowitz, M.D

Tzalco, A.: Autoplasty on the Lower Lip by Doubly Inverting a Flap from the Neck (Autoplastie de la lèvre inférieure par lambeau cervical deux fois renversé) *Presse méd* Par 1921 xxix, 723

In the complete excision of a carcinoma of the lower lip a large amount of tissue is often removed and in some instances sufficient tissue cannot be turned down from the cheeks or the upper lip to bridge the defect To repair this area successfully the author has devised a plastic operation which utilizes a flap of skin obtained from the median line of the neck.

upward so that the base of the flap is in proximity to the lower lip Care is taken to maintain uniform thickness in the flap The flap is then turned upward and its edges are sutured to those of the area of defect The outer layer of skin is then in proximity to the teeth and gingiva but the author maintains

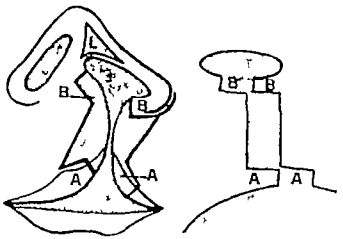
tightly apposed to prevent the formation of a hematoma.

If necessary transverse incisions are made along the inferior border of each mandible in order to resect all glandular tissue These edges are then united and the original median and transverse incisions in the neck are brought together Horse hair sutures are used throughout to prevent unnecessary suture scarring In the formation of the flap allowance is made for retraction.

Loyal E Davis, M D

Ombrédanne, L.: Restoration of the Lower Border of the Nostril in Simple Harelip. (Restauration du seuil de la narine dans le bec-de-lièvre simple) *Presse méd* Par 1921 xxix, 703

In harelip operations surgeons have given nearly all their attention to the reconstruction of the lip and have almost entirely neglected the correction of the nostril. When the nostril is not properly reformed there is always decided disfigurement, however well the lip has been reconstructed.



For the reconstruction of the lip Mirault's method as modified by Jalsquier is recognized as the best. In Ombrédanne's opinion a similar procedure should [illegible] in cases involving the nose but he urges

states that at the two extremities of the labial fissure the same autoplastic manœuvre must be done exactly on both the buccal orifice and the nostril. To form a good lip Strip A must join exactly at A', and to form a good nostril Strip B must join exactly at B' (See figs above) W A Brennan

NECK

Lenormant, C.: Four Cases of Malignant Branchioma (Quatre cas de branchiomes malins) *J de chir* 1921 xviii, 358.

In Lenormant's opinion primary malignant tu- [illegible]

experienced surgeon to recognize them at once and he will find them quite often if he looks for them. Siegel found six unpublished cases in two years and Lenormant operated upon four cases in the same space of time. Three of the latter four cases had the [illegible]

fourth was a case of transformation of a branchial cyst.

Several cases of transformation of branchial cysts into malignant branchiomata are reported in the literature. The growth in the author's case was a mixed tumor with both mesodermic and epithelial elements. The majority of tumors of branchial origin are mixed tumors. [illegible]

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adenopathy In its size and irregularity, its early adherence and fixation, its quick infiltration of the tissues, and its form which is that of an indurated

plaque like a breast or parotid cancer it differs decidedly from a lymphosarcoma and the rarer tumors of the inter-carotid gland.

In the ablation of the tumor it is prudent to remove the regional glands although in forty nine cases of branchial epithelioma Veau found that they became invaded in only nine This procedure is [illegible]

reported nine deaths in sixty cases in which the tumor was completely removed. The unfortunate fact remains, however, that very early recurrence is the general rule. Lenormant's cases form no exception to this rule as there have been three recurrences, one of which appeared within a month after the operation. Operation under such circumstances would scarcely appear justified were it not for the fact that there is an occasional permanent recovery The author suggests that possibly the combined use of surgery and radium would improve the prognosis. W A Brennan

Bevan, A. D.: Two Cases of Mediastinal Tumor Which Proved To Be Substernal Thyroid Enlargement. *Surg Clin. N Am.* 1921 i, 957

Both cases reported were those of men past 50 years of age who came to the hospital because of symptoms of mediastinal tumor pressure such as engorgement of veins in the neck and chest, hoarseness due to pressure on the recurrent laryngeal nerve, increasing dyspnœa on exertion and cyanosis of the face.

At examination percussion revealed an enlarged area of dullness over the mediastinum and more to the right side. The Wassermann test was negative. The X ray showed a tumor in the mediastinum. In one case there was thyroid gland on the right side of the neck only, while in the other case no cervical gland was palpable.

The treatment was much the same in both cases. Under local anæsthesia an incision was made along the inner side of the sternocleidomastoid muscle, the omohyoid muscle and deep fascia were divided and the thyroid cartilage and trachea were exposed.

In Case 1 the right thyroid lobe was grasped and pulled upon, blunt dissection was made along the tumor into the mediastinum, and as much of the gland as possible was removed by morcellation after ligation of the superior and inferior thyroid [illegible]

closed except for a lower opening for the gauze.

In Case 2 in which no glands in the neck were [illegible]

the chest. The mass was found to extend part way to the left side. All the tumor was removed except the left portion.

In both cases the pressure symptoms were greatly relieved, and although in Case 1 infection ensued and what was probably the greater portion of the remainder of the gland sloughed out, both patients were progressing favorably some weeks after the operation.

As supplementary treatment, thyroid gland extract and the X ray were used.

M. H. Hobart, M.D.

Ochsner, A. J., and Nuzum, J. Ligation of the Inferior Thyroid Artery and Vein According to the Method Introduced by Professor De Quervain: The Use of Local Anesthesia in These Operations and in Thyroidectomy. *Surg. Clin. N. Am.* 1921, 1, 98.

thyroid vessels has produced a practically standardized technique, the close relationship of the inferior thyroid arteries to the inferior parathyroid glands, the recurrent laryngeal nerves, and the trachea has produced a variety of methods for ligating the inferior thyroid vessels.

The point where the inferior artery crosses the recurrent laryngeal nerve near the outer border

main blood supply. In the former case permanent tetany and in the latter transient tetany may result.

If the inferior thyroid artery is ligated in the

indirectly. The authors feel that the operation developed by Professor DeQuervain fills these requirements.

Only one vessel should be ligated at one sitting and the interval between successive ligations should be at least a week.

The ligation is performed under local anesthesia. The incision is made in the line of the Kocher transverse

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tion extending 5 cm. along the outer margin of the muscle. The inferior thyroid artery may then be located by gentle exploration with the finger near the center of the free space in front of the carotid artery. Caution is essential to avoid rupturing the inferior thyroid vein. The inferior thyroid artery is exposed for a distance of 1 cm. from its origin and closed by two ligatures 1 cm. apart. After tightening of the ligatures, but before the knot is secured, the patient should be asked to speak and to cough as hoarseness will indicate that the

amount of collateral circulation so that the nutrition of the inferior thyroid gland will not be interfered with. They claim also that "the benefit is greater from ligating one inferior thyroid artery

The patient receives two hypodermic injections of ¼ and ⅙ gr. of morphine respectively and 1/150 gr. of atropine sulphate, the first two hours and the second one hour before operation. The local anesthetic is prepared according to the following formula:

Apothesine gm. 0.6 — gr. 7.5

tion are generally used. Anesthesia is complete within three to five minutes and lasts for one to two hours. Anesthesia is secured by the intradermal

and subcutaneous injection of the apothesine solu tion and the blocking of nerve trunks. The regional points and the method of injection are shown by plates.

The presentation includes an analysis and sum mary of the results of the method in 107 consecutive cases including all types of goiter from marked ex ophthalmic to simple colloid goiters In this series there were no deaths In each case liquid nourish-ment was taken immedietely after the operation and the patient was discharged from the hospital at the end of one week. W O Jonnson M D

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Eisendrath, D N : The Lymphatics of the Female Breast in Relation to Carcinoma of the Breast. *Surg Clin N Am* 1921 1 1025

The three cases presented bring up the question of the frequency with which primary involvement of the subclavicular and supraclavicular lymph nodes occurs in carcinoma of the breast, and the question as to what change is necessary in our radical opera tion to conquer this regional invasion. In the dis-cussion of the conditions in which an exploration with removal of all lymph node bearing fat of the subclavicular and supraclavicular regions is justi fied attention is directed to Mornard's investi-gations of the relation of the lymphatics of the breast by means of injection

Five types of lymphatic drainage toward the axillary, subclavicular and supraclavicular nodes are described. Type 1 found forty five times in 100 breasts, is the classical type, consisting of three to five lymphatic trunks leaving the outer and lower border of the mammary gland and reaching the central group of lymph nodes lying on the axillary vein. The first set of relay nodes were those lying along the outer border of the pectoralis major muscle. When the injections passed beyond these pectoral and axillary nodes the fluid reached the subclavicular nodes and in some cases even the supraclavicular nodes.

In Type 2 the lymphatic trunks lead to the outer axillary chain. This type was found in twelve breasts.

In Type 3 found in thirty five breasts, there are two lymphatic trunks, axillary and subclavicular One of these is the classical type described as Type 1 The other lymphatic trunk is formed by two or three smaller ones which leave the upper inner portion of the breast. These trunks proceed directly to the group of nodes lying beneath the clavicle and pass upward beneath the pectoralis minor near its costal insertions. When this type is present a single barrier formed by the subclavic ular nodes separates the breast from the supra-clavicular nodes. In twenty cases the axillary and subclavicular territories were completely inde-pendent.

In Type 4 lymphatic trunks are found between

muscles.

In Type 5, found in three breasts, the lymphatic trunks lead directly to the supraclavicular nodes. This explains how the axillary nodes may be spared while an early invasion of the supraclavicular nodes occurs, especially in cancers of the upper inner quadrant.

The author describes two sets of supraclavicular nodes, and states that he is not yet convinced of the necessity for the removal of the lymph node-bearing fat of the supraclavicular region as a routine procedure in the radical operation. In can-cer of the upper half of the breast however as in three cases described, all of the fat and other tis-sues as far as the clavicle and if possible to the subclavian vein itself should be removed.

J D Ellis, M D

Greenough, R. B. and Simmons, C. C : End Results in Cancer Cases Cancer of the Breast *Boston M & S J* 1921 clxxxv 853

The authors report on 103 personally observed cases of cancer of the breast and offer a method of classification which they have found satisfactory in a study of the cases occurring at the Massachu setts General Hospital The scheme for the report ing of the end results of the treatment of carcinoma may be summarized as follows

A Record all cases entering the surgical wards with the specified diagnosis during the period selected

B Eliminate all re-entries. No case should ap-pear twice in the report.

C Eliminate all cases recurrent after previous operation in a hospital or elsewhere, these are not cases of primary attempt to cure

D Deducting $B + C$ from A we have the num ber of cases of cancer available for the study of the tis-

F Cases of palliative operation.

G No operation advised or performed.

H Operative deaths

I Operative mortality $H + E + F$

J Operability (radical operations) $E + D$

K Operability (all operations) $E + F + D$

For the study of the end results of treatment cer tain cases included in D are of no value and should be deducted, viz.

L Cases proved not to be cancer either by pathologic examination of tissue absence of recur rence or autopsy

M Cases of patients untraced for the required time-interval — three years, five years — after they left the hospital.

N Cases of patients who have died of other diseases within the required interval of time and without evidence of recurrence.

O The cases remaining after deducting *L*, *M* and *N* from *D* are available for the study of end-results as follows

P Radical operations.

Q Palliative operations.

R No operation.

S Number of patients alive without recurrence (three years five years)

T Number of patients who have died (after three or five years) without recurrence

U Number of three-year or five year cures. All operations $S - T$

V Number of three-year or five-year cures Radical operations.

W Percentage of three-year or five-year cures. All operations $U - P + Q$

X Percentage of three year or five year cures. Radical operations $V + P$

Using this method for reporting end results the authors submit the following table comparing the results obtained in cancer of the breast at the Massachusetts General Hospital for the periods 1894 to 1904 and 1911 to 1914, each case having been studied over a five-year period

END-RESULTS CARCINOMA OF THE BREAST

	1894-1904	1911-1914
A Total entries — carcinoma of breast	613	115
B Re-entries (entered more than once)	80	8
C. Recurrence from previous operation	65	4
D Cases available for study of operability mortality etc	468	103
E. Radical operation	360	74
F Palliative operation	56	20
G No operation	52	9
H. Operative deaths	15	0
I. Operative mortality (H÷E+F)	3.6%	0%
J Operability radical operations (E+D)	77%	72%
K Operability all operations (E+F+D)	89%	91%
L Inconclusive cases lack pathologic examination	0	0
M Inconclusive cases untraced	38	5
N Inconclusive cases death within time limit without recurrence	2	3
O. Cases available for end-result data	428	95
P Radical operations	320	69
Q Palliative operations	56	17
R No operation	52	9
S. Number of patients alive and well	64	22
T Number of patients who died without recurrence	7	1
U Number of five-year "cures," all operations	71	33
V Number of five-year "cures," radical operations	67	22
W Percentage of cures," all operations (U÷P+Q)	19%	27%
X. Percentage of "cures," radical operations (V÷P)	21%	32%

The following table gives the results obtained in 67 cases of primary radical operation, the cases being classified according to the type of carcinoma

	Cases	"Cures	Percentages
Scirrhus	8	1	12½
Medullary	17	6	35
Cancer"	34	11	32
Adenocarcinoma	6	2	33
Colloid	2	2	100

In order to estimate the prognosis in 95 traced cases they were further classified according to the conditions found at operation

Class	Condition	Cases	"Cures"	Percentages
1	Early favorable (no enlarged glands)	14	10	71
2	Favorable (glands slightly enlarged)	26	9	33
3	Average cases (glands markedly enlarged	29	3	10
4	Advanced cases (palliative operation)	7	1	5
5	Hopeless cases (no operation)	9	0	0

R. C. Wren, M D

Kilgore, A. R.: Is Paget's Disease of the Nipple Primary or Secondary to Cancer of the Underlying Breast? *Arch Surg* 1921 iii, 324

On the basis of intensive study the author has come to the conclusion that the term "Paget's disease should be limited to those lesions presenting the typical histology (1) epithelial hypertrophy (2) subepithelial round-cell infiltration, and (3) Paget's cells.

All the cases of Paget s disease reported emphasize the importance of removing the entire breast for any chronic, persisting eczema or ulcer of the nipple, regardless of the apparent presence or absence clinically of deeper breast changes At operation, the decision for or against axillary dissection should depend, not on frozen-section diag

cutting across and axillary any gross or found in the excised breast.

Three cases are reported which demonstrate that Paget's disease is usually primary to cancer of the breast which has been found frequently in association with it. In one of these cases no change whatever had occurred in the breast, and in two cases the early changes of what was probably duct carcinoma had begun when the breast was excised. A fourth case is reported in which all the evidence of the history and pathology pointed to a reversal of this order the cancer in the breast apparently having originated first. If the deductions in these cases are correct, both schools in the controversy regarding the primary or secondary nature of Paget's disease have been right. H. A. McKnight, M.D.

TRACHEA AND LUNGS

Whittemore, W. and Chaffin, G. L.: Extrapleural Thoracotomy for Advanced Unilateral Pulmonary Tuberculosis; Report of a Case. *Boston M. & S. J.* 1921, clxxxv, 249.

Artificial pneumothorax produces marked beneficial results in many cases of pulmonary tuberculosis but cannot be used in 25 per cent of the cases because adhesions prevent the collapse of the lung

today the procedure is comparatively safe.

The authors report a case treated at the Massachusetts General Hospital. The patient was an Italian laborer, 34 years of age, who gave a history of tuberculosis of eight years duration. All the clinical signs of advanced pulmonary tuberculosis were noted on the right side but none on the left side. Operation was performed after the method of Paulsen and Sangman under regional and local infiltration anæsthesia. The incision extended parallel to and about 3 cm. from the spine and then laterally along the tenth rib. Subperiosteal resection of sections of the upper eleven ribs, beginning at the eleventh and working upward, was done. The sections removed ranged in length from 2 to 11½ cm., the upper sections being the shorter. After

sure on the right lung.

Following the operation the patient gained rapidly. After two and one-half months he left the hospital

ment and at last reports he was again rapidly improving.

The authors feel that although the case reported is by no means cured, the marked improvement shown justifies the operation performed. Several roentgenograms and illustrations are included in the article. Roscoe C. Webb, M.D.

HEART AND VASCULAR SYSTEM

Bralzew, W. R.: Surgery of the Heart (Zur Chirurgie des Herzens) *Nauichnaja med.* 1920, No. 3.

The author takes up the question of the removal of foreign bodies from the heart. The indications for operation are to be considered with caution. In the case reported by Bralzew were severe heart attacks and marked dyspnœa. Any foreign body in the heart may eventually cause inflammation or scar tissue. When an operation is necessary for the removal of foreign bodies, the resection of ribs is not to be considered. Bralzew obtained access to the heart by resecting the fifth costal cartilage. If necessary the upper and lower costal cartilages may be separated at the sternum and drawn back with a retractor. The costal cartilages so handled by the author healed back in place without any difficulty. In the case reported the heart stopped whenever traction was applied to it.

Bralzew tested the resistance of the heart by experiments on animals. He found that a dog's heart withstands compression of the right ventricle for two or three minutes. The most dangerous procedure is luxation of the heart out of the wound which causes traction on the large vessels. In the dogs experimented upon the heart finally stopped. In clinical surgery however there have been cases in which such manipulation did not cause any untoward results.

In suturing the wound edges must both be grasped in one and the same movement. The author recommends the placing of two preliminary sutures, one on either side of the site of the foreign body. The heart must be sutured with silk. The suture should be so introduced that the intima is not included.

Dujarier and Kostenko recommend catgut for heart sutures. The author used catgut No. 4 to sew

be employed for wounds that perforate into the heart cavities. The author did a two-row suture of the heart in which beside the interrupted suture he employed also a thin silk suture. He hopes in this manner to prevent postoperative adhesions. The case operated upon by Bralzew was as follows:

A 24 year-old man received a shrapnel wound of the chest four months previously. The bullet entered the posterior wall of the thorax at the lateral edge of the scapula at the level of the fifth rib. A pleural exudate on the right side, high fever, dyspnœa and palpitation of the heart developed. At intervals there was pain in the heart region. The pulse was 120. The patient wore a compression band to prevent thorax widening. The heart was enlarged to the left. The X-ray showed the bullet in the right ventricle. Operation was performed under combination anæsthesia.

An arched parasternal incision was made extending along the sixth costal cartilage. The pleura

bulged outward The mammary artery was ligated and a pericardiotomy was done On palpation the projectile was found to be firmly embedded in the connective tissue. After extraction the myocardium was sutured with three interrupted sutures of silk The first line of sutures was then covered by suture of the epicardium The costal cartilage was replaced and a tampon inserted The tampon was removed on the fourth day

The patient made an uneventful recovery in spite of postoperative bronchitis He was discharged from the hospital at the end of two months in excellent condition Some palpitation occurs when he runs and there is still slight enlargement of the heart to the left The X ray shows no pericardial adhesions The electrocardiograph shows a slight functional derangement of the myocardium After three and one-half months the results still remain excellent HIRSH (Z)

PHARYNX AND ŒSOPHAGUS

xl, 355

The authors report a case of œsophageal dilatation of unknown cause On examination with the X rays

atony of the œsophageal musculature Sencert and Simon consider the condition analogous to megacolon and due to inability of the muscular tissue to withstand the normal intra-œsophageal pressure By their diagnostic measures they have shown that there is no organic obstruction in the cardia in these cases On the basis of this finding it is evident that the usual treatment of dilatation, divulsion or cardioplasty is incorrect as both of these procedures are directed toward removing an obstruction and re-establishing the cardiac orifice. The authors have therefore devised a new operative technique as follows

Through an abdominal incision the œsophageal opening of the diaphragm is dilated and the œsophagus is pulled downward into the abdominal cavity for about 8 cm The œsophagus is then fixed in its new position to the borders of the œsophageal orifice of the diaphragm If necessary to permit rapid evacuation of the œsophagus a longitudinal incision 4 cm. long including the stomach wall at its lower extremity is made and closed by transverse sutures in two layers. LOYAL E DAVIS

Ladwig, A.: A Remarkable Case of Malformation of the Œsophago-Tracheal Tube, with a Contribution to the Interpretation of the

1921 xvii, 615.

The author had the opportunity to observe a rare form of tracheo-œsophageal malformation in a child which was born prematurely (between the twenty eighth and thirtieth weeks) and died three days later from bronchopneumonia In this case no food at all was retained Autopsy showed that the œsophagus ended blindly at the level of the bifurcation of the bronchi From the gastric end probing led into the trachea There were therefore, two distinct parts to the œsophagus, an upper part ending in a dilated blind sac, and a lower part ending in the trachea. In addition, the left kidney and ureter were absent and

communication of the lower end with the trachea. Microscopic examination showed that after opening into the trachea the œsophagus was continued in the tracheal wall for some distance as all its structures—circular and longitudinal muscle fibers, glands, and stratified epithelium—were found there. This malformation has been observed before and according to the author is best explained by the theory of Kleba, Giffhorn, and Hoffmann according to which the embryonic folds intended to separate the œsophagus and trachea grow in an abnormal direction. GAHUL (Z)

Lilienthal, H.: Carcinoma of the Thoracic Œsophagus; Extrapleural Resection and Plastic. Ann Surg 1921 lxxiv 359

lation.

The patient was a 35 year-old man with a partially obstructing squamous-cell carcinoma below the arch of the aorta.

At the first step the operator lifted a skin flap

backward to a point about 3 in below the point at which it began This flap was used in fashioning the new œsophagus to replace the resected part.

A 6-in. subperiosteal resection of the ninth rib was then done and the pleura stripped forward away from the posterior mediastinal region The eighth, seventh, and sixth ribs were cut through near their spinal attachments after the pleura had been peeled away and then the tenth rib also was divided. The pleura could now be pushed forward so that the organs within the mediastinum were exposed through a wound large enough to permit the surgeon to work in its depths with both hands.

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ing which marked the tumor within the gullet was about 1½ in. below the arch of the aorta. The skin flap was placed in the wound so that it partly encircled the mobilized œsophagus and its cutaneous surface was toward the viscus This first step of the operation was concluded by packing the wound with gauze. The patient was then able to swallow fluids.

Two weeks later without anæsthesia of any kind the wound was spread apart and the tumor bearing section of the œsophagus was resected Nourishment was first given through a stomach tube passed into the lower œsophageal opening and later through an Einhorn tube passed from the mouth to the stomach through the gap left by the resection At the end of another week the pedicle of the skin flap was cut across. Subsequently there was contraction of the cicatricial tissue at the mucocutaneous margins making it necessary to divide the strictures by stellate incisions and pass bougies frequently The final step consisted in closing the posterior œsophageal opening with a suture and performing a plastic operation to cover the defect in the patient's back with skin by the use of sliding flaps. A few days

A number of drawings made at the operation are reproduced in the article. There are also roentgenograms and a photograph

Other cases in which the same exposure was effected are reported but all proved inoperable The conclusions drawn are as follows

1 Transpleural resection of the œsophagus has a forbidding mortality

2 Fatal infection follows the primary opening of

of

mit the operator to see clearly and to work safely with both hands.

4. Resection of the œsophagus in the posterior mediastinum can be done by performing the operation in two stages. In the first stage, the œsophagus should be freed from its attachments and the mediastinum sealed. In the second, ten to fourteen days later the resection should be performed.

5 This procedure deserves a fair trial by thoracic surgeons.

MISCELLANEOUS

Stincer E A Foreign Body Extracted from the Posterior Mediastinum by Posterior Thoracotomy (Cuerpo extraño del mediastino posterior extracción por toracotomía posterior) *Rev de med. y cirug de la Habana* 1921 xxvi, 767

The patient whose case is reported by Stincer was a young man who had been operated upon for purulent pleurisy two years previously The drainage tube broke because of poor condition of the rubber and a part of it remained in the pleuropulmonary cavity Its presence ultimately gave rise to a fistula. A posterior thoracotomy was therefore performed to remove it.

The operation showed that the fragment of drainage tube had perforated the left lung and lodged in the posterior mediastinum where its upper end touched the pleural vault. Its position was oblique from above downward and from left to right. The only damage resulting from its wandering was the suppurative fistulous tract. The removal of the tube was very difficult but successfully accomplished. The patient rapidly recovered. W A. Brennan.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Erkes, P : Sliding Hernia of the Intestine (Der Gleitbruch des Darmes) *Ergebn. d Chir u Orthop* 1921 xiii 466.

Sliding hernæ occur only on the right and left sides of the body in the corresponding parts of the

are due to developmental defects. As causes of the occurrence of the so-called acquired sliding hernia are given weakness of the subperitoneal tissue, atony obstipation and rarely trauma. A frequent cause is a previously present large hernia of the small intestine which especially on the right side draws down the parts secondarily with the parietal peritoneum The author distinguishes hernia with and without a hernial sac, suspended hernæ and internal sliding hernæ of the cæcum in the right iliac fossa.

The diagnosis of a sliding hernia is uncertain but is suggested by severe pain, incomplete reduction or slight bulging during coughing A truss is of no value. Operation is the treatment of choice. Three operative methods are used (1) reduction *en masse* (2) resection of the sac and suture and (3) a plastic operation on the mesentery The results

are usually good Operation has numerous technical difficulties Incarceration and appendicitis are serious complications According to statistics, the mortality of the operation is 3 per cent This form of hernia occurs more often in adults than in children. Its incidence is 1 1 per cent. Wintermer (Z)

Augé, A. and Simon, R.: Hernias of the Semilunar Line of Spiegel (Contribution à l étude des hernies de la ligne semi-lunaire de Spiegel) *Rev de chir* 1911 xl, 897

In the authors opinion the term ventral hernia is too general. Hernias of the anterior abdominal wall should be described according to their location A true, spontaneous herniation through the semilunar line of Spiegel is rare The authors report a case.

In this condition there is an egg-shaped tumefaction at the level of the umbilicus at the lateral border of the rectus muscle The mass is partially reducible in the recumbent position and is increased by coughing and otherwise increasing the intra-abdominal pressure. In about half the cases the hernia is covered by the peritoneum, subcutaneous tissue, and skin, and in the other half by the external oblique in addition. The border of the hernial orifice is upon the rectus sheath and is usually indurated and firm. There was no hernial sac in the case described in this article

The authors believe that this type of hernia is due to a congenital malformation—complete absence of the muscular wall of the abdominal cavity or an anomaly of the vessels of the abdominal wall. Such anomalies open the way for the exciting factor of increased intra-abdominal tension or trauma to the abdominal wall Lipomata and

Blumenau, M B.: Diaphragmatic Hernias (Zur der Diaphragmalhernien) *Vestnik sudeb med* 1910 715

The subjective symptoms of diaphragmatic hernia consist of pain, a sense of pressure chiefly on the left side dysphagia, vomiting, and obstipation

The affected side breathes more weakly than the normal side. If the organs in the hernia contain air there is tympany if they contain liquid, there is dullness When there is tympany the breath sounds cannot be heard. If the lung is compressed there is bronchial or amphoric breathing. Often intestinal sounds are audible. When the hernia contains fluid and air succussion sounds may be heard

In hernia on the left side the heart is often forced over to the right. When there is severe compression of the heart systolic sounds arise from kinking of the large vessels. These signs suggest the picture of a pneumothorax with a pleural exudate. Diaphragmatic hernia can be differentiated from the latter condition, however by (1) frequent changes in

The patient was a 22 year-old soldier who, following a sudden chill, suffered pain in the left side of the breast and attacks of coughing, dyspnœa, hæmoptysis, obstipation, and vomiting. His pulse

and distended. Peristalsis was absent. The temperature was 101 degrees Injection was without result. The patient died on the tenth day of his illness and the fourth day after he entered the medical clinic. The diagnosis was ileus and fibrinous pneumonia. A surgeon was not consulted. At postmortem examination the colon, the entire great omentum, and a foul exudate containing numerous colon

Dodgson, H.: Traumatic Rupture of the Diaphragm; Patient Lives Over Two Years. *Proc intern* 1911 cvii, 219

This paper is based on an autopsy performed on the body of a coal miner who two years before his death, had received a crushing injury under a mass of coal

Examination showed a circular aperture about 4 in in diameter in the center of the left half of the diaphragm. In the left pleural cavity anterior to

of death.

The author has been able to find the report of only one other similar case in which the patient lived any considerable length of time.

I. E. Bramow M.D

Cambresier G.: The Surgical Treatment of Ascites (Traitement chirurgical de l'ascite). *Arch méd belges* 1911 lxiv 640.

For more than thirty five years there have been numerous attempts to treat ascites surgically

The diversity of the methods employed indicates the complexity of the problem and the fact that simple paracentesis is not satisfactory The surgical *mortality in ascites is high being 30 per cent, but* the causal affection, if left to itself, has an unfavorable prognosis and is often rapidly fatal

One of the factors favoring surgical intervention in ascites is the light which laparotomy throws on the nature of the causative condition.

The author considers in detail the principal operative methods which, he states may be divided into two classes (1) those having as their object the anastomosis of the portal vein to the vena cava (2) those having as their object permanent drainage of the ascitic fluid toward some other point in the body From a review of the results of these methods he comes to the following conclusions

1 In cases of ascites laparotomy has brought lesions to light which medical or surgical treatment has been able to overcome.

2 Mutilating operations are unnecessary

3 Anastomosis of the portal vein to the vena cava interferes with the antitoxic rôle of the liver by withdrawing a considerable quantity of blood from the hepatic circulation This explains many postoperative deaths.

4 Frequently the drainage routes are obstructed by peritoneal adhesions

5 Voluminous cystic pockets may be formed in the anterior abdominal wall following operations draining the fluid toward this region.

6 In view of the fact that the causal condition will be fatal if left to itself, operation should be considered, as a number of definite recoveries have resulted from such treatment W A. Brennan

Deaver J B Peritonitis. *N York M J* 1921 cxiv 257

The author introduces his article with the statement that the salient points of a subject so important as peritonitis do not suffer from being repeated from time to time.

He describes the mechanism of the equilibrium between exudation and absorption which in the absence of a pathologic process, prevents the accumulation of even a small amount of free fluid in the

infective. The bacterial flora of peritonitis is generally a mixed one.

The dangers of purgation in early peritonitis, as

When an abdomen is opened in a doubtful case in which the peritoneum in the immediate vicinity of the lesion is green and there is foul-smelling pus, the infected cavity should be surrounded by a rubber dam or oiled silk and lightly packed with gauze, the wound being left open but silkworm gut being carried through the margins and tied loosely to prevent protrusion of the intestines. The packing should remain in place for several days. Purgation is as ill advised during the *postoperative treatment as before operation.*

J D Ellis M D

GASTRO-INTESTINAL TRACT

Palmer E. P., Watkins, W W., and Mills, H. P : Linitis Plastica. *Surg Gynec & Obst.* 1921 xxxiii, 281

Linitis plastica is known under a variety of names. It affects the stomach involving the small intestines only rarely and by extension. It produces diffuse and marked hypertrophy of the submucous connective tissue and to a lesser degree of all the coats of the stomach except the mucosa where there is an atrophy of the glandular elements. The stomach wall is thickened to six to eight times its normal thickness and becomes rigid like a leather bag Its lumen is decreased The thickening is most marked at the pylorus.

The chief characteristics of linitis plastica are a slow progressive stenosis of the stomach resulting in food stagnation and often a perceptible tumor in the epigastric region, with absence of pain hæmorrhage, and early vomiting The localized form of this condition is situated near or at the pylorus. The disease is most common between the ages of 40 and 60 It is classified as both malignant and benign.

The symptoms are slow in onset and are those of a progressive obstruction with loss of weight and cachexia. The condition is often mistaken for scirrhous carcinoma and scirrhotic syphilis of the stomach

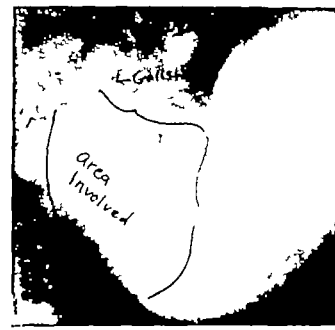


Fig. 1 Roentgenogram of stomach showing area of involvement in linitis plastica.



Fig. 2 Interior view of resected portion of stomach



Fig. 3. Exterior view of resected portion of stomach

(*Lexikon Plastics — Palmer Wallace and Mills*)

The X ray offers the best differential diagnosis It shows a filling defect with a smooth inner margin and the absence of peristalsis in the involved area.

Treatment is always operative. Gastrectomy is the operation of choice.

A case is reported with the detailed pathologic findings I E. Bunnow M D

Sch[illegible]

1996

Schoenfeld raises the following questions

1 In which forms of gastric ulcer should internal treatment give way to surgical treatment and what complications demand operation?

2 What method of operation is best, especially when there are complications?

3 Is it possible to obtain permanent results by surgical procedures, and what method gives the best results?

Routine early operation is not to be considered as the isolated, uncomplicated ulcer and the acute (usually multiple) ulcer belong to the internist. While occasionally dangerous complications may develop, healing usually occurs smoothly and without any significant scar Internists admit, however that their treatment is satisfactory in only about 50 per cent of the cases Moreover the patient's social condition and the severity of the symptoms must be taken into consideration.

Operation is indicated in the following cases

1 Stagnation of gastric contents due to stenosis or hour-glass stomach which does not yield to any other treatment. If a gastro-enterostomy is performed in such a case, it must be done on the fundus, a procedure which is difficult as this part of the stomach is under the ribs For this and other reasons, resection is recommended

2 Perigastritis with adhesions to surrounding tissue. Often the small adhesions cause more difficulty than the large ones.

3 Persistent hyperacidity especially with dilatation and weakness of the stomach musculature. It is in these cases that gastro-enterostomy is most used.

As hypersecretion and disturbances of motility of the stomach are dependent upon the tonicity of the vagus nerve, section of the vagus at the cardiac end has been suggested but this procedure has not yet been generally accepted The results of gastro-enterostomy have become better since the pylorus has been closed or narrowed Without such closure [illegible]

are reported by surgeons therefore surgeons must receive more cases with disturbances of motility These perhaps are due to retention of secretion. Also in cases of ulcer located some distance from

4. Ulcers which, by their long duration and repeated bleeding threaten life, i e callous ulcers. These undoubtedly should be resected as in such cases there is also the danger of carcinomatous change. Perforation may occur very suddenly Often it is the first sign of a latent ulcer The prognosis depends on the time at which operation is performed. Shock is not a contra indication. In cleansing the abdominal cavity one must not forget the Douglas pouch. American surgeons drain it toward the rectum or suprapubically and by so doing have decreased the death rate to 19 per cent. In doubtful cases an exploratory laparotomy is advisable. Morphine tends to obscure the picture. The prognosis with regard to the bleeding is relatively favorable unless very large vessels are eroded. Often it is impossible to discover the point of hemorrhage with the naked eye Several authors attribute to gastro-enterostomy an indirect effect

such as the removal of the irritating blood masses, antiperistalsis, hyperacidity and hypersecretion. Jejunostomy also is recommended to quiet the stomach These procedures are without influence on hard walled callous ulcer When hemorrhage is repeated, operation is indicated as the next hemorrhage may be fatal. Gastro-enterostomy has had good results in some cases but in a large number the results are late and obtained apparently only after careful internal treatment. Moreover the ulcer remains and therefore the danger of hemorrhage cicatricial contraction, the threatening peptic ulcer and the danger of carcinomatous change. Resection is becoming more and more the method of choice The simple excision of the ulcer is not at all to be recommended Even in the most favorable cases only the ulcer is removed and not the tendency to ulcer formation. It is the province of gastric physiologists to explain the relationship between the vagus and sympathetic nerves and to find a method of operating upon these nerves which will cure the gastric ulcer disease. The transverse resection has the advantage that it sections the vagus-nerve fibers going to the pylorus. Perhaps it is for this reason that its results are so permanently favorable. When there are the least signs of neurosis or hysteria operation is contra-indicated. In cases of encapsulated perforations operation should be delayed in order that local peritonitis may not be made general.

Trust (Z)

Bruett, H : The Surgical Treatment of Gastric Ulcer [illegible]
End [illegible]
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Beltre
klin. Chir 1921 cxxiii, 524.

The author considers the clinical symptoms of gastric ulcer, the t
enterostomy the
operations and t
gastric ulcer during [illegible]
cusses in detail the indications for operation, the different operative methods and the value of the various procedures for the different types of gastric ulcer
T

examination of the stomach is of special value. Chemical examination of the stomach contents and the feces is necessary only when a new ulcer or a late complication is suspected.

In the choice of the operation both the duration of the results it usually yields and its mortality must be considered.

The newly formed uncomplicated gastric ulcer belongs to the internists. In cases of callous ulcer of the fundus of the stomach at a distance from the pylorus the permanent effect of a gastro-enterostomy is very unsatisfactory Of importance in such cases is the danger of subsequent hemorrhage, perforation, and the formation of a peptic jejunal ulcer The end results of resection are very much better and therefore this procedure is to be preferred. Transverse resection has a considerably lower operative mortality than the Billroth II method and the modifications of the Billroth method and creates conditions more nearly resembling those of the normal stomach
[illegible]
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gastric cancer is considerably higher than that due to callous ulcers at a distance from the pylorus. When the presence of a carcinoma is suspected any type of ulcer [illegible]

jejunum) In cases of acute hemorrhage due to ulcer operation should be performed only exceptionally except in cases of callous ulcer Heller (Z)

Barrington Ward, L. E.: Gastric Operations: A Note on One Hundred Consecutive Cases. *Lancet* 1921 ccl 382

A careful study of operative and postoperative results in a series of 100 consecutive cases [illegible]

operative procedures.

Gastro-enterostomy is a most valuable but much abused operation. Clear indications for it are (1) gastric stasis due to organic obstruction of the stom
[illegible]

in case the best available treatment is simple excision by means of the knife or by Balfour's method with the cautery
[illegible]
of
wi
dilated stomach. The postoperative course is exceptionally easy Ulcers prone to or undergoing malignant change are completely removed by this method and the cure of symptoms is more certain than when gastro-enterostomy is done.

Ulcers of the duodenum in the series of cases reviewed were apparently cured by gastro-enterostomy

Poor results reported by some authors may be due to the performance of gastro-enterostomy in the absence of definite pathologic evidence of duodenal ulcer

The end-results of gastrectomy for malignant

improve the outlook in such cases

R W Nichols, M D

Konjetzny, G E.: Gastric Sarcoma (Das Magensarkom) *Ergebn d Chir u Orthop* 1921 xiv 256.

This article consists of two parts, one dealing with the general pathology and pathological anatomy and the other with the clinical aspects of gastric sarcoma.

According to various statistics sarcomata constitute from 0 5 to 1 0 per cent of the malignant tumors of the stomach Both sexes are equally affected, and the condition occurs most frequently during middle age The etiology and histogenesis still remain almost entirely unexplained. A causal relationship between trauma and tumor formation

less frequently from the subserosa Primary sarcoma grows either in the form of a circumscribed, nodular pedunculated, or broad-based growth, or as a flat infiltrating growth, partially or diffusely involving the stomach wall Its site is usually the greater curvature and then, in order of frequency the posterior wall, pylorus, lesser curvature, anterior wall, cardia, and fundus Although true dilatation of the stomach does not often occur the tendency toward shrinkage noted in cases of carcinoma is absent Circular growths of sarcoma, however often cause a narrowing

The forms of gastric sarcoma may be classified as (1) external, exogastric sarcoma (2) pedunculated internal endogastric sarcoma, and (3) flat sarcoma invading the stomach wall These various forms are described in detail and with good illustrations A special type of sarcoma, lymphosarcoma, is described, and its relationship to aleukemic lymphomatosis is discussed The differential diagnosis of

and carcinoma sometimes occur at the same time and very rarely there may be growths which contain both carcinomatous and sarcomatous tissue

Whether the relation between primary and secondary gastric sarcoma is different than that between primary and secondary gastric carcinoma cannot be judged on the basis of the material on hand.

Unlike gastric carcinoma, sarcoma remains stationary for a considerable time Metastasis is also more uncommon but occurs in a considerable number of cases Round-cell sarcoma is the most malignant of all varieties. Sarcoma does not have a definite plan of metastasis like gastric carcinoma The statement that its metastases form along the blood stream appears to be untrue as regards gastric sarcoma as the secondary growths of the latter develop more frequently along the lymph channels Histologically, there have been observed in the stomach round-cell sarcoma, lymphosarcoma, spindle-cell sarcoma, myosarcoma, and myxosarcoma Round-cell sarcoma, including lymphosarcoma, is found in 40 per cent of cases and spindle-cell sarcoma and fibrosarcoma each in about 20 per cent The course of gastric sarcoma varies greatly Hesse found in 162 cases an average of twenty two months with no great difference between round and spindle-cell sarcoma It may be assumed that some forms of gastric sarcoma are more malignant than gastric carcinoma.

One of the most important complications of gastric sarcoma is perforation, which apparently occurs more frequently than in cases of carcinoma

analysis may not show any change for a long time Anacidity is not an early symptom and even in cases of flat, ulcerating and infiltrating sarcoma, free acid may still be present. Tumor formation is the most

cases of sarcoma than in cases of carcinoma.

The so-called Kundrat symptom, swelling of the follicles at the base of the tongue, is not conclusive but is suggestive of gastric sarcoma. Gastric tumor is almost always associated with an aleukemic lymphomatosis of the stomach. The hemoglobin content was decreased in all of the cases studied, often very much. The leucocytes were often slightly increased There is no constant blood picture pathognomonic of gastric sarcoma Except in cases

diagnosis based on the roentgen examination may be expected only in cases of pedunculated exogastric sarcoma The other forms cannot be differentiated with certainty from carcinoma or other gastric tumors by means of the X ray Radical removal by operation is the treatment of choice An opinion as to the permanency of the results cannot be given as yet because the number of cases reported is not yet sufficient.

Von Tappeiner (Z)

De Graaff W C and Nolen W : Investigations Regarding Digestion and Absorption in the Small Intestine in Patients with Intestinal Fistula (Untersuchungen ueber die Diegestion und die Resorption im Duenndarm bei Patienten mit Darmfistel) *Nederl Maandsch v Geneesk* 1921 x 113

The authors report their studies in two cases The first was that of a man 37 years of age who had amoebic dysentery and the second that of a girl 25 years of age who had ulcerative colitis In each case a separate ileum and cecal fistula was formed in order that the contents of the ileum might be examined separately

The results of the thorough investigations demonstrated that a carbohydrate diet yields a chyme containing much water and a nitrogenous diet a chyme containing little water The passage of the intestinal contents from the small to the large intestine takes place continuously at night as well as during the day but the quantity which passes over during the day is larger The chyme requires from two to nine hours to reach the ileocecal valve. Its appearance and consistency are always the same It is a thick yellow pulp with a slight odor which is never distinctly fæcal Its reaction is generally alkaline but after the chief meal is acid

Proteolysis reaches its maximum at night and its minimum at midday The average proteolytic strength is 3 750 units the amylolytic 7 500 The contents of the small intestine contain no amino acids or coagulating albumin, and no glucose except after a diet rich in carbohydrates In the cases studied volatile fatty acids in combination with aromatic acids and biliary pigment were present Phenols were found constantly in one case but never in the other Indol was demonstrable neither in the chyme nor in the urine Indol formation takes place in the large intestine. Its physiological importance has not been entirely established

KOWITZ (Z)

Zoe[illegible]

Duenndarm einschliessende retrocoecale Hernie mit beginnender durch eine begleitende perforative Appendicitis verursachte Einklemmung durch Operation geheilt) *Deuts he Zischr f Chir* 1921 clxv 267

The author operated upon an 18-year-old boy for peritonitis due to perforation of the appendix. A large sac containing the entire small bowel was found behind the cæcum The upper part of the jejunum did not appear within the peritoneum at first but receded immediately behind it into the sac The last end of the ileum made its appearance first at the small opening of the sac just behind the cæcum Only the colon was within the peritoneum

The sac was first split and then removed The loops of small bowel were found to be collapsed entirely empty cyanotic, and nowhere adherent to the sac That part of the bowel lying in the opening of the sac was narrowed and its wall was chronically inflamed

In the author's opinion the cause of the hernia was a malformation. The patient never had any symptoms indicating hernia formation The small bowel was in a state of strangulation caused by an inflammatory swelling in the region of the inflamed appendix which narrowed the neck of the hernial sac The patient was discharged as cured.

In conclusion the author reviews fifteen similar cases reported in the literature. VOLLHARDT (Z)

Eggers, H : Postoperative Intestinal Occlusion Following Lateral Entero-Anastomosis and Resection of the Small Intestine with Antiperistaltic Position of the Intestinal Loops. (Die chirurgische Behandlung des Magenge schwuers unter besonderer Berueckichtigung der Fernresultate zugleich ein Beitrag zur Frage des Ulcuscarcinoms) *Beitr z klin Chir* 1921 cxvii 235

The author reports two cases of ileus which proved fatal following entero-anastomosis of the small intestine with antiperistaltic position of the intestinal loops. On the basis of these cases Eggers states that it is not a matter of no importance whether the intestinal loops are anastomosed in an anti peristaltic position as some textbooks say (Kausch Schmieden) The causes of the immovability due to this position must be sought in (1) the still more diminished (3) the extent of the anastomotic opening and (4) the weakening of the patient's general resistence For these reasons the antiperistaltic position should be avoided whenever possible and when it is necessary on account of too great weakness of the patient, Kappeler's method of attaching the efferent loop for a considerable distance should be employed, although even in this case kinking may take place at the last suture

It is better to choose an isoperistaltic position or end to-side union When the lumina show a great variation in width, the entero-anastomosis should be short but not less than 3 cm. and spur formation should be avoided by wide joining of the serous surfaces of the narrower loop

The mechanism of ileus is illustrated by schematic drawings VORSCHUTZ (Z)

Wortmann W : Enterostomy in the Treatment of Intestinal Occlusion and Peritonitis (Die Enterostomie in der Behandlung des Darmver schlusses) *Med Klin* 1921 xvii 932

Wortmann reviews the cases of intestinal occlusion treated [illegible] ostomy for th definite this

cially in occlusion due to kinking and cases of inflammatory mechanical ileus. Wortmann employs it primarily with removal of the occlusion and also secondarily if stasis persists after the removal of the obstruction. Not infrequently intestinal occlusion, especially that due to kinking, is relieved only by an enterostomy. This result is due to the fact that the valvular closure caused by the overfilling distention, and kinking is released by the evacuation of the bowel.

Enterostomy gives good results also in carefully selected cases of peritonitis. A bowel which has been injured by peritonitis does not always recover at once spontaneously, in some cases functioning only after stimulation by irrigation. If possible enterostomy should be performed in the lower part of the abdomen on the left side under local anesthesia, and in an upper loop of the ileum rather than in a lower loop or the cæcum because most kinkings and adhesions occur in the upper loops. The loop of bowel is drawn forward, and an incision is made between two clamps for the introduction of a No. 13 or 14 Nelaton catheter. With a few sutures the site is then inverted like a Kader Witzel fistula, the

following the return of normal peristalsis the fistula closes spontaneously in nearly all cases. If it does not, however, its closure may be effected by a slight operation. VON TAPPEINER (Z).

Mokrowald, P. P.: Enteroliths (Zur Frage der Enterolithen). *Aerztl. Ass. d. Gem.-Genossenschaftswes. u. d. Rigaschen Militairbez.* 1911, 1.

Intestinal stones are rare. Schwalbe reported one case among 100,000 surgical cases in the Catherine Hospital in Moscow. In the University Surgical Clinic in Moscow in the course of thirty-two years only two cases were observed among 7,680. The author observed three cases among 5,193 major operations in fourteen years in the hospital in Wologda. *In two of these the operation was necessitated by* the enteroliths, and in one the stone was found accidentally. In Russian literature only five cases are reported (Schwalbe, Chalaïoff, Handelin and Struve, Erichsen, Leshnew). The author's three cases were as follows:

CASE 1. The patient was a 38-year-old woman who, for several years, had had a hard movable tumor the size of the fist in the right side of the abdominal cavity. The growth gradually became larger. There were periodical attacks of obturation ileus and chronic obstipation. At operation two

were found. Two stones were extracted by enterotomy. The mucosa was unchanged. The patient recovered. The stones were dark brown and weighed 49.6 and 32.2 gm. They consisted of cellulose, magnesium and calcium salts.

CASE 2. The patient was a 50-year-old woman who, for three years, had had a hard nodular, rough and movable tumor the size of the fist in the ileocæcal region which caused periodical obturation ileus and obstipation and œdema of the legs. At operation two tumors were found in the cæcum

mesenteric glands were the size of hen's eggs. Appendectomy and cæcotomy were done. The intestinal wall was 3 cm. thick. The enteroliths weighed 51.7 and 12 gm. They were dark brown and had inorganic incrustations. The cross section showed islands of organic substance. Microchemical examination showed small amounts of cellulose and large amounts of inorganic salts (calcium phosphate, triple phosphates, calcium and magnesium salts). The mucous membrane was greatly ulcerated. The intestine was sutured with difficulty on account *of the friability of its wall. The abdominal cavity* was tamponed. Peritonitis developed on the

multiple tuberculous ulcers of the cæcum, descending colon, and ileum, and perforation of one of the cæcal ulcers from which the perforative peritonitis originated (bacillus coli communis). The intestinal suture had held together well. Microscopic examination showed cæcal tuberculosis and tuberculosis of the mesenteric glands.

In the presence of enteroliths ileus develops gradually, as hypertrophy of the proximal loop tends to force the stones through the intestine. Tiling of Russia has reported a case of complete intestinal

are especially favorable for the formation of entero-

operation was performed for chronic appendicitis. In the region of the cæcum was a diverticulum in

ticulum Appendectomy and cæcectomy were done and the fecal stone extracted The patient recovered

The author considers enterotomy as the method of choice in dealing with intestinal stones.

HERRE (Z)

Halstead A. E.: Ileocolic Intussusception Protruding Through the Anus: Operation and Recovery *Surg Clin N Am* 1921 i 1083.

The author reports a case of intussusception in a nursing infant of four months. At the time of operation performed three hours after the first appearance of the symptoms the ileum which constituted the head of the intussusception presented at the anus. The abdomen was opened, the invaginated small intestine manipulated toward the cæcum the ileum pushed entirely out of the large intestine and the distal end of the ileum just above the ileocæcal valve which was bluish black and showed several areas of necrosis varying in size from 1 to 2 cm in diameter was covered with a small piece of omentum which had been cut off from its attachment The ring of traumatized serosa and muscularis which marked the neck of the intussusception was then infolded by suturing together the uninjured serosa on each side of it and the abdominal wall was closed in layers without drainage. The postoperative course was uneventful. Halstead discusses the incidence types, symptoms, and treatment of this condition

FREDERICK CHRISTOPHER, M.D

DeQuervain, F The Effect of the Removal of the Appendix upon the Function of the Intestine (De l influence de l'ablation de l appendice cæcal sur le fonctionnement de l intestin) *Bruxelles méd* 1921 i 252

The physiological rôle of the appendix remains unknown none of the numerous hypotheses offered have been proved The question as to whether the removal of the appendix is an advantage or a disadvantage to the organism is still unanswered To determine the influence of this operation upon the intestinal function DeQuervain studied 500 cases. The time which had elapsed since the operation varied from three months to three years. The results of the study were as follows

In 60 per cent of the cases there was no alteration in the intestinal function in 29 per cent, evacuation of the bowels became better and in 11 per cent evacuation became more difficult. The removal of the appendix therefore appears to have overcome constipation three times more frequently than it increased it a fact which does not argue strongly in favor of a secretory action of the appendix stimulating peristalsis.

DeQuervain believes all operations involving the peritoneum are followed by analogous reflex phenomena. He investigated this subject in 200 cases of operation for inguinal hernia. The results revealed that the function of the intestine remained unchanged in 58 per cent of the cases, was accelerated in 33 5 per cent and was slowed in 8 per cent There is therefore a striking agreement between these findings and those following appendectomy

DeQuervain believes that hernia, as well as chronic appendicitis is capable of upsetting the visceral reflexes sometimes in the direction of acceleration and at other times in the direction of an arrest of peristalsis. The final result of the removal of the cause—appendicitis or hernia—is essentially the same.

The relation of these observations to the operative indications in cases of appendicitis appears to be evident. We are justified in proposing early operation pending an attack and in the interval between attacks without considering the suppression of the

during the first day is 0 7 per cent. It is to be presumed that a patient would not prefer to take the risk of an 8 per cent mortality rate to escape the 9 per cent risk of postoperative constipation.

LOYAL E. DAVIS, M.D

Barbosa, J M: Cystic Pneumatosis of the Intestine (La pneumatosis quistica del intestino) *Med Ibera* 1921 xv 217

Cystic pneumatosis of the intestine, which is rare and difficult to diagnose, is characterized by the appearance of numerous gaseous cysts in the coats and on the surface of the intestine These cysts vary in size and do not contain any fluid. About 70

gastric ulcer, especially in the cicatricial and stenosing period.

Barbosa describes the case of a man aged 47 years who had suffered from gastralgia for ten years. Laparotomy revealed a callous ulcer of the pylorus and numerous gaseous cysts scattered over the mesocolon and the free border of the ileum. The detachment of these cysts caused extensive hemorrhage. Death occurred soon after the operation from cardiac failure.

Callous ulcer of the stomach or pylorus was found in 59 per cent of the seventy cases reported in the literature and pyloric stenosis in 72 per cent. In eight cases no concomitant lesion of the intestine was discovered

The affection may take different clinical forms. Barbosa distinguishes (1) the pseudo-appendicitis type, (2) the peritoneal type and (3) the type simulating acute or chronic intestinal obstruction. The clinical signs are a ballooning of the abdomen a flaccid and easily depressed wall, a peculiar

In the author's case the cysts were examined microscopically Some of them were well vascular

ued while others showed no vascularity The contents consisted always of carbon dioxide oxygen, hydrogen or nitrogen gas Sulphuretted hydrogen was never found. The walls of the cysts consisted of dense and sclerosed fibrous tissue

W A BRADRIAN.

Homans, J : Torsion of the Caecum and Ascending Colon. *Arch Surg* 1921 iii, 395

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congenital maldevelopments plus a functional disturbance—rapid gas formation in the intestinal canal For the development of a twist of the right colon the latter must have a mesentery In addition, there may be a displacement (1) of the caecum toward the middle or left side of the abdomen, (2) of the caecum upward toward the liver

The studies of a number of men have demonstrated that retardation and churning of the contents of the bowel occur in the right colon for a considerable period also that in the ascending colon and caecum fermentative digestion takes place. Disturbances in the anatomy of this region may produce physiological changes bringing about

ing colon with a long mesentery may form a loop which rotates, or become locked about another intestinal coil or the caecum may twist or bend on itself

Three cases are reported, the operative procedures employed in each being described

I E. BRENNOW M D

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Heretofore carcinomata of the large intestine have been regarded as inoperable when they are not mobile in relation to their supporting structure or when regional or remote metastases are present. Those with abscess formation or fecal phlegmons are least suitable for radical operation In such cases heretofore the abscess was opened first and resection was delayed until after the cessation of the symptoms of inflammation.

The author reports three cases of his own In the first two there were large tumors of the descending colon and the sigmoid flexure which had been produced by perforation of a carcinoma and abscess formation In both cases the tumor was successfully mobilized and without incision of the abscess, was placed in front of the abdominal cavity In the first case a transverso-sigmoidostomy was performed in a second stage of the operation and the two intestinal fistulæ were closed in a third stage At the end of two years the patient was still entirely well The second patient died from pneumonia and urosepsis one month after the operation.

In the third case there was an ileocecal tumor the size of a fist. Primary resection resulted in a cure. The tumor was permeated by numerous abscess cavities Histologic examination revealed tuberculosis

On the basis of his experience the author concludes that the indications for the radical removal of tumors of the large intestine must be extended.

WISCHNEWSKY (Z)

Hagstroem, P : A Case of Stake-Injury (Noch ein Fall von Pfahlungsverletzung) *Upsala Lakarf Forh* 19 n s xxvi, 215

A 12 year-old boy fell from a hay-stack and alighted in a sitting posture on a stake. The stake penetrated the rectum to such an extent that he was unable to free himself The stake was about 1 yd long and from 1 to 1½ in in diameter At first the injury caused little disturbance After three hours the patient was taken to the hospital in an automobile. The transportation caused him much pain On admission to the hospital he showed signs of peritonitis The urine was normal, showing that the bladder was intact A laparotomy was done immediately The rectum was perforated to the base of the Douglas fold and the lowest coil of the ileum was contused and its serosa torn The opening in the rectum and the injured portions of the small intestine were sutured and the abdominal cavity was closed Recovery resulted.

In the surgical section of the University Hospital in Upsala five cases of stake injuries were treated in the period from 1919 to 1921 Three of these injuries were extraperitoneal and two intraperitoneal Recovery resulted in every instance. POTT (Z)

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Orth O : The Ideal Cholecystectomy (Zur Frage der idealen Cholecystektomie) *Zentralbl f Chir* 19 1 xlviii, 1106

He cites one case in which the ligature slipped from the cystic duct and caused an accumulation of bile under the peritoneum the stump having been peritonized The pulse dropped to 60 per minute due to the absorption of the bile.

The slipping of the ligature from the cystic duct is dependent upon the biliary pressure from the liver

and the physiological pressure due to the tonus of the choledocho-duodenal sphincter The former should be 200 mm. and the latter 675 mm of water Therefore until the wound in the cystic duct is closed, which takes three days it is safer to insert a drainage tube.

The author employs the extra median longitudinal incision *VORSCHUETZ (Z)*

Specht O : T[illegible] lder Followin[illegible] sur Frage ue[illegible] nach Cystekton[illegible] 07

Experiments on animals and material from the Giessen clinic (3 704 operations on the biliary tract) have shown no proof that the gall bladder may be formed anew after cholecystectomy Occasionally there may be a dilatation of the cystic duct but this cannot be regarded as a substitute for the gall bladder This widening of the cystic duct, which occurs regularly in dogs, is very rare in man and when it does develop is rarely regarded as a cause of the difficulties necessitating the second laparotomy The formation of a stone in this stump of the cystic duct is possible, but very unusual

Kehr's statement that after the removal of the gall bladder the cystic duct tends to form a gall bladder with true stones has not been proved Therefore his suggestion that the cystic duct should be removed close to the common duct in every cholecystectomy to prevent the formation of a new gall bladder is of no value. In difficult cases it is often best not to isolate the cystic duct. In ninety nine cases in which such isolation was not effected no regeneration of the gall bladder was observed.

KONJETZNY (Z)

Kanavel A. B : Splenectomy under Local Anæsthesia in a Greatly Debilitated Patient *Surg Clin N Am 1921 i 965*

Kanavel describes in detail his application of Labat s technique to prevent excessive pain due to manipulation, particularly pulling of the viscera during laparotomy under local anæsthesia. A needle was passed obliquely inward on each side of the body of the first lumbar vertebra so that it pene trated the retroperitoneal tissues in the region of the cœliac plexus Thirty five cubic centimeters of a ½ per cent novocaine solution were used on each side After ten to fifteen minutes the abdomen was opened under local anæsthesia, the spleen was dislocated from the abdomen, two forceps were placed on the pancreatic and gastric side and one on the splenic side the splenic artery being grasped separately and the spleen was removed The tug ging and pulling on the viscera necessitated by such manipulation caused no pain. The spleen weighed 1 500 gm. J D ELLIS M.D

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES TENDONS, ETC.

Rosenow E. C. and Ashby W : Focal Infection and Elective Localization in the Etiology of Myositis. *Arch. Int Med* 1921 xxviii 274

The results of an investigation of twenty-eight cases of myositis at the Mayo Clinic and the findings in animals given injections of cultures made from material obtained from these cases are reported. The technique employed is that devised by the author and used in previous experiments regarding elective localization. In twenty five of the cases, foci of infection such as tonsils and teeth were removed and in twenty two of these this was fol-

venous injection into animals. Of these twenty seven positive cases, the streptococcus was found to have an elective affinity for muscle in twenty four the streptococcus and staphylococcus in two and the staphylococcus alone in one

Culturally the streptococcus showed two types of colonies on blood-agar plates one a small colony surrounded by a hazy zone of hæmolysis, and the other a slightly larger dry colony surrounded by a greenish zone The muscle lesions produced in rabbits were caused by the slightly hæmolyzing streptococcus in ten instances and by the green-producing type in ten instances, while in four cases both were present. The staphylococcus alone was responsible for but one case.

The cases of myositis investigated fell into three distinct clinical groups (1) cases of acute and chronic myositis without other demonstrable lesions at the time of study (2) cases with predominating symptoms of myositis in which periarthritis and arthritis were present, and (3) cases in which myosi tis was the chief factor but there was associated neu ritis or perineuritis.

Cultures from these three groups were injected intravenously into rabbits and the resulting lesions tabulated In the first group were ninety animals in the second sixty-one, and in the third fifty-one. Of the first group of animals, 88 per cent had muscle lesions, 16 per cent were found to have turbid joint fluid and only 1 per cent had lesions in the nerves In the second group the corresponding figures were 79 per cent, 28 per cent, and 0 per cent, while in the third group they were 67 per cent, 8 per cent and 35 per cent. These results paralleled very close ly the findings in the clinical cases, not only with regard to muscular lesions, but also with regard to the incidence of lesions in the joints in the arthritis group and in the nerves in the neuritis group.

The relation between the results of this group of experiments and the results obtained in other ex

periments on elective localization is striking There were numerous instances of very marked electivity brought out in this series, some of the most specific instances being present in animals which had been given injections of salt solution suspensions of the small numbers of bacteria obtained in pus expressed from tonsils.

A detailed report of clinical and experimental

capillaries, and œdema, with loss of striation of the muscle fiber as the swelling increased were the chief characteristics. Later in larger lesions, fragmentation and necrosis of the muscle fibers occurred as leucocytic and other cells became numerous. Of

may be drawn that myositis, including even the mild transient affections of muscles, is caused in the main by lodgment and growth of bacteria, usually streptococci, which have elective affinity for muscle tissue" G H Jackson Jr M.D

Janssen, M : Dysostosis Cleido-Cranialis. *J Orthop Surg* 1921 iii, 468

The author calls attention to the two principal symptoms to which dysostosis cleido-cranialis owes its name (1) the enlargement of the fontanel and (2) the pseudarthrosis or absence of parts or of all of the collar bone. He calls attention also to two other conditions which were present in seven cases (1) shortening of the toes and (2) bilateral flattening of the chest.

In Janssen's opinion the mechanical malformation and the symptoms of growth-stunting may be explained by the assumption that the fœtus has

growth (law of the vulnerability of fast-growing cell groups)

On the basis of these principles Janssen concludes that oligohydramnios may produce dysostosis cleido-cranialis in the eighth week.

F W Carrington, M D

Barrie, G.: Hæmorrhagic Osteomyelitis. *Am J Surg* 1921 xxxv 253

The term "hæmorrhagic osteomyelitis" was first used by the author ten years ago to describe a bone lesion which previously had been considered a

malignant neoplastic process He believes that the designations "giant-cell sarcoma" and giant-cell tumor are inadequate, inexact confusing and misleading The giant cell encountered in this lesion is a scavenger or a foreign-body type of cell

should be emphasized also that an area of osteolysis shown by the X-ray may mean one of many other gross pathologic lesions It may be necessary to combine the clinical and X ray pictures with the gross and microscopic studies to make a positive diagnosis of hæmorrhagic osteomyelitis.

The condition is most frequent in the first and second decades of life. Months or years may have elapsed in the development of the bone to a large size. There is usually a history of injury which may have been remote. Pain is not constant. There is enlargement locally Sensitiveness to pressure is present and there is some limitation of motion in the nearest joint If the lesion is in the lower extremity the subject limps The roentgenogram shows a clear-cut round or oval area of osteolysis. The periosteum is usually intact.

The gross specimen shows vascular granulation tissue interspersed with areas of fibrosis or degenerated hyaline masses.

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Jones, S. F : Sclerosing Non-Suppurative Osteomyelitis as Described by Garré; Report of a Case, with the Roentgenographic and Pathologic Findings and a Review of Literature. *J Am M Ass* 1921 lxxvii, 986

The sclerosing types of osteomyelitis are those in which there is merely an enlargement and a thickening of the bone without suppuration or fistula formation

lesion, and considerable infiltration of the soft parts. The skin over the affected bone, however is not reddened and there is no formation of pus. With the subsidence of the temperature, the swelling of the soft parts disappears, only the osseous enlargement remaining

Mauclaire refers to the statement of Kocher that a considerable number of cases of bone sarcoma which have been cured by amputation were merely cases of sclerosing non-suppurative osteomyelitis The latter type of bone involvement may be

confused also with the syphilitic and sarcomatous types and the rare type of solid osteitis fibrosa encountered in the long bones

The syphilitic osteitis and periosteitis result in the fusiform enlargement of the shaft of the bone and lead to a diffuse hyperostosis closely resembling

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blood and spinal fluid Wassermann reaction should establish the diagnosis

In bone sarcoma the problem is even more difficult, for frequently there is a history of trauma to the affected area. The initial rise of temperature, the absence of glandular enlargement, the infiltration of the soft parts, which is present early in the sclerosing type of osteomyelitis and the absence of cachexia and rapid loss of weight are important

be made in every case

In osteitis fibrosa with or without the formation of cysts the predominating clinical symptom is that of a spontaneous fracture and the swelling and pain are not symptoms of which the patient complains. The temperature is usually normal and the pathologic process is so insidious in its onset that only the occurrence of a slight trauma resulting in fracture of the affected bone causes the patient to seek surgical advice

Trauma cannot be considered as an etiological factor Most observers believe that the disease is due probably to an inflammatory process in the long bones. We must depend upon the pathologic

L. C. DONNELLY M.D

Cohn I Observations Based on a Study of Injuries to the Elbow *Arch Surg* 1921 III 357

The author describes certain lines drawn upon the roentgenogram of the elbow joint whereby the *normal contour of the joint* or a deviation from the normal may be determined. The position of the capitellum is most important. With the elbow flexed to a right angle, the lateral view shows the capitellum occupying the sigmoid cavity In early

to about the ninth year passes behind the posterior border of the capitellum After this period approximately two-thirds of the lower epiphysis is anterior to it.

The plane of the anterior limit of the shaft of the humerus shows at least one half of the capitellum anterior to it. *A plane at right angles to the* base of the capitellum and bisecting it intersects the plane bisecting the long axis of the shaft at an angle of about 130 degrees With the forearm *extended and supinated, a plane bisecting the humerus* is intersected by a plane bisecting the ulna at an angle of approximately 170 degrees.

After the ninth year the olecranon occupies the entire olecranon fossa and overlaps the capitellum while in early life the capitellum is not overlapped by the olecranon.

A small group of patients treated by the author had deformity and limitation of motion and all of them presented themselves for treatment several hours after the injury with swelling around the site of fracture which made it impossible to maintain the hyperflexed position.

A number of cases have been reported as having epiphyseal separation when careful study showed the joints to be normal.

The roentgen ray is of inestimable value when properly interpreted. The roentgenogram must not be depended upon to show a fracture within an epiphysis in young children before the epiphysis has been sufficiently ossified. A disturbance of the relationship of the planes mentioned by the author would enable the roentgenologist to state that there will be a disturbance of function and deformity unless the condition is corrected. Delay in reducing the deformity increases the difficulty of treatment because of the swelling External rotators should be developed in cases with supracondyloid fractures of the humerus to prevent the carrying of the arm in internal rotation and consequent cubitus varus deformity

In the correct diagnosis of injuries to the elbow the history including both subjective and objective phenomena, is important. On inspection the position — semiflexion and diminished or lost carrying angle — should be determined Lateral mobility may be increased by a tear of the lateral ligaments and is exaggerated if one of the condyles is fractured in addition. It is further increased by contraction of the attached group of muscles which are unopposed by the group torn away from the shaft.

Palpation always reveals pain at the site of fracture. Therefore examination should be continued under anesthesia. Supracondyloid fractures should be reduced in hyperflexion because the triceps acts as a natural splint and the relaxed flexors have a tendency to bring the distal fragment into the bend of the elbow In fractures of the internal condyle pronation is desirable with hyperflexion to prevent contracture of the supinators attached to the external condyle, and consequently does not diminish the carrying angle.

In fractures of the external condyle hyperflexion and supination are required in order to relax the pronators of the forearm which are attached to the external condyle.

A conical bag with the apex down supported by tapes tied around the neck is found useful to prevent the bandage from slipping

After the tenth day flexion should be diminished at short intervals and contrast baths, massage, and passive motion limited by pain should be begun. Plaster molded splints should be used and the arm should be held in external rotation. The dressing should be closely observed for the first twenty-four hours to prevent Volkmann's ischæmic contracture. The hand should be included to prevent secondary swelling. A roentgenogram should be taken and studied following reduction. Active and passive movements, massage, and resistive exercises should be employed after the fourth week.

RUDOLPH S. REICH, M.D.

FRACTURES AND DISLOCATIONS

Scudder, C. L.: Certain Problems Concerning Fractures of Bones. *Ann. Surg.*, 1918, lxvii, 280.

With regard to fractures of bone there are certain problems which are not altogether settled, viz. (1) the process of repair, (2) the causes of

The author states that the older methods (rigid bone methods) of treating fractures by "setting" the fractured bone, by the use of splints and plaster of Paris to fix the "set bones," by immobilization of the joints above the fracture, by keeping tightly constricting and compressing splints and bandages on the fractured limb for weeks, the soft parts, the skin, nerves, vessels, and muscles all being left without care, are abominable and should not be tolerated today. Good results obtained under this ancient régime were obtained in spite of the treatment rather than because of it.

The following methods have proved valuable:

1. Extension and counter-extension. These require careful supervision and a nice discrimination in their application. They permit supported active movement of the joints adjacent to the fractured bone at an early date and continuously throughout the treatment.

2. Direct bony traction, which brings the forces of traction and counter traction into action most effectively and accurately.

3. The direct grasp of bone without penetration for the application of traction.

4. The direct traction method of Parkhill and Freeman in America.

5. The direct operative treatment advocated and popularized by Sir Arbuthnot Lane.

6. The suspension of fractures which helps to eliminate muscular contraction and renders traction forces more effective.

7. The use of the roentgen ray.

The treatment of fractures may be greatly improved by:

1. An organized fracture service in each of the large hospitals in the country.

a. Special wards should be used for the treatment of fracture cases. It is impossible to care adequately for these cases when they are scattered throughout a hospital as under such conditions the responsibility is divided among many persons, there is no concentrated interest, and too much work is delegated to ignorant subordinates. The general service would be more free if separated from the fracture cases.

b. A special personnel should be in charge of these fracture wards. The chief of this service should be a surgeon of broad general experience who is actively interested in molding the policy of the fracture division. He alone should be finally responsible for the results. Serving with, and under this chief should be the necessary assisting surgeons, resident house surgeons, and nursing force. The service of this staff should be continuous throughout the year.

c. This continuous control should include the out-patient service where the ambulatory cases are received and treated. Each day of the week there should be an out patient clinic for fractures which the fracture service controls and with which it is in intimate touch. The policies of the out patient and house fracture service should be identical and under the control of the chief of the service. Cases of fracture should be followed until the maximum functional results are obtained and the wage earner is on his feet and re-established.

d. Insofar as fractures are concerned, the emergency ward for accident service should likewise be under the direct care of the chief of the fracture service. A fracture received in the accident ward should be regarded as an emergency case requiring the immediate attention of those directly responsible for the ultimate result. A fracture should be considered as much an emergency as a case of perforated gastric ulcer. The initial treatment is vital to a satisfactory outcome in both instances.

e. An operating plant in connection with the house service is essential. The operative fractures must be kept apart from septic operations. Separate instruments must be employed.

f. A lecture room with easy access to the wards is necessary.

2. Adequate instruction of the undergraduate medical student.

3. The institution of smaller hospital units in towns adjacent to, and remote from, large centers.

4. Graduate instruction of the general practitioner interested in fractures.

5. Formal instruction of medical students intending to become specialists in this branch of surgery.

6. Encouragement of specialization within general surgery of the surgery of fractures. Accident surgery today covers a complicated and varied field.

7. The organization of a clinical surgical fracture society meeting once a year for the sole discussion of fracture problems.

L. C. DONOHUE, M.D.

Thomas, T T : Fixation by a Wood Screw Without Arthrotomy in Certain Fractures of the Neck of the Femur *Am. J Surg* 1921 xxxv 292

Certain neglected fractures of the neck of the femur are treated by the author by means of the Whitman abduction method followed by fixation by means of a wood screw without arthrotomy Under anæsthesia the thigh is abducted and a plaster spica extending from the lower thorax to and including the foot is applied and an opening 6 by 8 in. with its center over the great trochanter is cut in the cast. A few days later the patient is again etherized and an incision about 3½ in long is made over the most prominent portion of the great trochanter in the long axis of the limb to expose the anterior and posterior margins of the great trochanter

With the X ray as a guide a screw is driven through the trochanter and neck into the detached head of the femur The necessary length is determined by the roentgenogram but as the shadow is larger than the object, the screw should be ¼ to ¾ in. shorter than the distance from the external surface of the trochanter to the surface of the middle of the head in the X ray plate This obviates the possibility of driving the screw through the head and into the acetabulum The wound is then wiped out with a little dichloramine T and completely closed dressings are applied and the opening of the cast is reinforced by means of several plaster of Paris bandages.

Because of the small exposure there is practically no chance of infection. If the patient is young enough he may be permitted to get about on crutches with the cast on at the end of four or five weeks following the introduction of the screw The frag

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The author presents the reports of four cases in which he employed the method described. He states that to date the results have been good but not sufficient time has elapsed to warrant final judgment as to the outcome. RUDOLPH S REICH, M.D

Kurlander J J : Fracture of the Spine of the Tibia *J Am M Ass* 1921 lxxvii 855

The author states that fracture of the spine of the tibia is rare and may or may not be associated with injury to the crucial ligaments. In this connection he describes the anatomy and physiological action of the crucial ligaments and the knee joint.

A résumé of the literature regarding fracture of the tibial spine is given.

Kurlander believes that practically all fractures of the tibial spine are produced indirectly by powerful traction on the crucial ligaments as the tibial spine is practically inaccessible to direct violence Three cases are reported

CASE 1 The patient was a man 19 years of age. In a fall his leg was suddenly flexed under him and he struck his knee on the curb stone. Swelling severe pain, and loss of function followed almost immediately and persisted for three weeks, at the end of which time he was seen by the author The X ray disclosed a complete transverse fracture of the tibial spine A plaster cast was applied with the leg in complete extension The cast was removed in six weeks and active and passive motion then instituted. Recovery was complete.

CASE 2 The patient was a woman 50 years of age who fell with the knee strongly flexed and abducted Examination revealed rupture of the internal lateral ligament and swelling pain, tenderness, and loss of function. The X ray disclosed avulsion of a spine of the tibia. The patient was seen four months after the injury

CASE 3 The X ray showed only a crack through the tibial spine The fragment was not removed from its bed The symptoms were thought to be due to a displaced external semilunar cartilage

The diagnosis may be made positively only by means of the X ray The most presumptive signs are blocking and locking of the knee

The treatment should be conservative. Under anæsthesia the knee should be manipulated until full extension has been obtained and then immobilized in extension in a plaster cast for eight to ten weeks After the removal of the cast massage and passive motion should be instituted

When chronic disability due to blocking of extension persists it is best to remove the offending fragment of bone through a patellar incision. The post patellar pad of fat should be removed in order that a good view may be obtained. The obstruction to complete extension should then be removed and the incision closed Complete extension should be maintained in a plaster cast for six weeks and massage and motion then begun.

FRANK G MURPHY M.D

SURGERY OF THE BONES, JOINTS MUSCLES TENDONS, ETC

Gallie, W E.: The Implantation of Tendons. *Am J Surg* 1921 xxxv 268.

Gallie states that wounds of tendons heal by ordinary scar tissue which is produced by the areolar membranes on the surfaces and the connective tissue trabeculæ which separate the bundles of fibers, This scar tissue when subjected to strain is apt to stretch or break unless it is present in considerable amount

To unite tendon to bone as in tendon fixation or transplantation it is necessary to place the tendon in close contact with the bone over a considerable area in order that the scar tissue may be strong enough to withstand the anticipated strain It is necessary also to remove all the areolar membranes from the surface and it is best to split the tendon in order that the raw surface may come in contact with the bone

To unite tendon to tendon the raw surfaces must be placed in contact over a sufficient area to insure

the required strength in the scar This may be done conveniently by braiding or splicing one tendon into the other PHILIP LEWIS M D

McWilliams, C. A.: The Values of the Various Methods of Bone Grafting Judged by 1,290 Reported Cases. *Ann Surg* 1921 lxxiv 186

The author has analyzed all bone graftings reported in the literature and the replies obtained from a questionnaire. He considers a method as successful only when the graft produced a satisfactory amount of new bone

Connective tissue seems to be essential in the formation of bone. Osteoblasts are indistinguishable from fibroblasts. The first occurrence in bone formation is the gathering of fibroblasts around a blood vessel In this new fibrous tissue calcium is deposited by some unknown influence which goes on to the formation of bone If calcium is deficient fibrous union results If there is too great mobility between the fragments, cartilage is formed but this may eventually become changed into bone. When there is no mobility as when one bone is fractured and a parallel bone acts as a splint, there is no formation of cartilage There are three requirements for successful bone grafting

1 The graft must bridge a defect.

2 It must be of a size and type to reestablish the circulation

3 It must act as a stimulus to osteogenesis.

The osteoperiosteal method of bone grafting is the method most often successful, and the intramedullary method is least often successful The presence or absence of periosteum seems to be immaterial Suppuration is apparently the most evident cause of failure. Insufficient, or even too brief, immobilization seems to be a very frequent cause of failure Grafting should not be undertaken if a roentgenogram shows the ends of the bones to be markedly atrophied, a condition caused by deficiency in nutrition due to too tight or too long prolonged immobilization, suppuration, neurotrophic disturbances, or senility L C DONOVAN M D

Haas, S. L.: Function in Relation to the Transplantation of Bone. *Arch Surg* 1921 iii, 425

In a series of experiments on dogs two metacarpals were resected one being transplanted to the paraspinal muscles and the other denuded and replaced in its original position so as not to allow contact with other bone. The dogs were then allowed to walk

The experiments lasted from forty-eight days to three years The transplants were then removed

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functioned showed very much less degeneration than those transplanted to the spinal muscles.

The author concludes that function undoubtedly exerts a definite influence on the viability of a transplant. Those from young animals

ROBERT V FUNSTON M D

Putti, V Arthroplasty *J Orthop Surg* 1921 iii 42

This paper is based on an experience of 113 arthroplastic operations done by Putti in the past ten years forty knees, thirty-eight elbows, seventeen hips, ten jaws, two ankles, two fingers, two toes, one wrist, and one shoulder

Absolute indications for arthroplasty are sometimes encountered, e g ankylosis of the jaw bilateral ankylosis of the hip and ankylosis of the elbow in extension We must admit, however that it is seldom an absolutely necessary operation, and due consideration must be given to the patient's general health, age, temperament, and social state. It is not a suitable operation for children or for old

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fail utterly because of his unwillingness to carry on mobilization. His financial condition must also be considered. If he cannot afford six to twelve weeks of after treatment (depending on the joint involved) it may be best to advise against operation.

Post-traumatic arthritis is best adapted to arthroplasty The results of treatment are usually more successful in the monarticular type than in the polyarticular type The bony ankyloses give better results than the fibrous. One should not undertake the operation until the joint is entirely free from pain and swelling, and no trace of the primary disease remains As a rule surgical intervention is delayed until a year after all sensitiveness has disappeared Because of difficulty in determining the absence of latent infection, it is best not to operate on old tuberculous joints The author has done this in only one case. Ankyloses due to progressive arthritis is also not a good risk for arthroplasty In post war wounds the operation should not be done unless all sinuses are closed, unless we are sure that no foreign bodies or sequestra are present and unless no reaction follows massage, baking and gymnastics. Even then we should wait for months or even years. It has been said the prolonged delay may preclude the return of muscle function but clinical experience shows that muscles inactive for years can regain their function to a great extent rapidly

Regarding the special indications for each joint Putti states that the shoulder rarely requires arthroplasty because the immobility is compensated by scapular motion. The wrist requires operation only when it is rigid in flexion, but unilateral ankylosis of the hip is a deformity to which the patient cannot accustom himself From the author's viewpoint, the very narrowly limited indications for

arthroplasty on the knee should be much widened He states that since experience has shown the possibility of creating new joints which possess excellent functional qualities, which can support any work and which, even after many years do not lose their power, I think that also the knee arthroplasty ought to be accepted with greater faith and should be executed more frequently But at the

it must be executed by operators who have acquired a notable skill in the constructive surgery of the joints.

In performing the operation the incision should allow complete exposure of the joint but should not sacrifice the tendons and muscles which move the part. For the elbow, the Kocher incision is best for the hip a curved transtrochanteric incision with its base proximal, for the knee a U-shaped incision with its base downward for the shoulder and wrist, a straight cut and for the ankle, two lateral cuts. In the resection of the bone ends enough should be taken off to leave an interval of at least an inch between the new surfaces It is necessary of course, to interpose some sort of tissue, but there is lack of accord among surgeons regarding what it is best to use The author has always employed free flaps from the fascia lata to cover both epiphyses completely fixing them in place with catgut sutures.

After operation traction is applied for about a month to keep the joint surfaces separated The first movements should begin after ten days and should be passive They may be carried on by the patient himself by means of simple apparatus. Baking should be begun as soon as the wound is healed and continued for many months. When the lower limbs have been operated upon the patient should not walk until the thirtieth day About a month after the operation a critical period of pain and stiffness usually sets in during which the patient and the surgeon may begin to doubt the results. This is due to a drying up process and perhaps too much motion. The baking should then be discontinued for a while. After a few days the movements may be carefully resumed The post operative treatment is longest for the jaw and the knee.

The prognosis of arthroplasties as a whole is now more hopeful than it has been in past years. According to the statistics of the author's cases the best results are obtained in the elbow the next best in the knee, the next best in the jaw and hip The knee which has been considered the least adapted to this operation, has been found in the light of recent advances to be the joint in which the results most satisfactory both to the patient and the surgeon can be obtained.

In judging the results, the amount of motion is not the only criterion. The new joint must be painless, must perform a reasonable percentage of the functions of a normal joint, and must possess stability and fair resistance to hard work.

WILLIAM A CLARK, M.D

Campbell, W C. Arthroplasty of the Knee—Report of Cases. *J Orthop Surg* 1921 III 430

The knee joint presents the most difficult problem in arthroplasty and unfortunately it is also the joint which is most frequently ankylosed In solving this problem animal experiments are of little or no value because we cannot simulate the ankylosed human knee nor can we obtain intelligent cooperation in the case of an animal

Only a knee with ankylosis following acute infection is suitable for operation Arthroplasty may be advised for all cases of fibrous ankylosis and for bony ankylosis in which the normal structure of the adjacent spongy bone has not been changed. When a medullary canal has been established through the [illegible] intercondylar notch is obliterated and the end of the femur made to conform to the antero-posterior convexity of one normal condyle. A concave surface is then shaped on the upper end of the tibia.

[illegible] joint surfaces must be made to fit accurately to prevent lateral motion. At completion there should be considerable laxity with hyperextension possible to 40 or 50 degrees. In ten cases a pedunculated flap was interposed in nine, Baer's chromicized pig's bladder was used, and in two a piece of free fascia was inserted between the new joint surfaces.

Twenty cases are reported. In four of these, faulty material (Baer's membrane) caused failure and in three, a pre-existing low grade osteomyelitis prevented a good result. In nine cases definite voluntary motion was obtained in four slight motion and in five, satisfactory function.

In all the successful cases action of the quadriceps was in evidence at the end of six or eight weeks. In one case an arthroplasty had been done before and when the joint was opened the second time ample space was found between the bones but was filled up with dense scar tissue which prevented motion.

WILLIAM A CLARK, M.D

Cook, A. G and Stern, W G: Report of the Commission on Stabilizing Operations on the Foot. *J Orthop Surg.*, 1921 III, 337

The report of this Commission consists of two parts. The first by Cook, which is general in character calls our attention to the most important defects in the foot caused by infantile paralysis and shows that the disability of the leg and foot are due first, to the absence of muscle power which in time leads to disturbance of muscle balance, distortion of the bone faulty weight bearing strain

trauma, and the pain accompanying trauma, and second to lack of normal development from insufficient normal use From the consideration of these facts we come to the condition known as flail foot, the question as to the best method of obtaining stability of the foot in paralytic conditions, and the function and end-results two years after operation

The author calls our attention to the fact that a stabilizing operation is indicated only when the loss of function of the foot depends upon instability of the joint or joints, and when, after faulty balance has been corrected, the muscles are still unable to control the movements of the joints

From an analysis of some of the answers received to the questionnaires sent out by the Commission, it was learned that while three members of the Association preferred braces to any surgical operation, at least 95 per cent of the remainder preferred astragalectomy or some form of arthrodesis.

In comparing astragalectomy and the ordinary operations intended to produce arthrodesis it seemed to the Commission that there was no practical difference as far as the risk to life was concerned, but in order to come to some definite conclusion as to which operation was the best they visited and examined about 250 cases in the leading clinics of America. These cases were not selected but were taken at random and represented a fair cross section of the work.

Of the 250 patients examined by the Commission not over twenty had relapses such that the foot was unserviceable and could not be easily corrected and rendered serviceable by a secondary operation In comparing astragalectomy with transverse horizontal section—the former known as the Whitman operation and the latter as the Davis operation—the Commission concluded that astragalectomy done after the method of Whitman is the operation of choice for the following reasons

1 It is a clean-cut procedure and the operator can see what he is doing The surrounding tissues are not bruised or mangled, and if the wound becomes infected the stitches can be easily removed and the whole cavity exposed and thoroughly drained.

2 Regardless of the chances or process of repair it definitely and mechanically checks motion in three directions, adduction, abduction, and dorsal flexion, and lessens the range of plantar flexion

3. When there is lateral motion at the ankle joint it is sometimes necessary to supplement a transverse horizontal section with an arthrodesis at the ankle joint, thus preventing all motion at the ankle joint. It is urged as an objection to astragalectomy that the removal of the astragalus shortens the leg This is probably true, but the leg was too short before the operation and it does not appear to be appreciably shorter afterward The shortening can be corrected by placing the foot in a position of moderate equinus and by inserting a lift in the sole of the shoe The reconstructed foot is shapely well formed, and serviceable. No one unfamiliar with the operation of astragalectomy would ever suspect that the astragalus has been removed.

The second part of the report which is presented by Stern, is the more technical and detailed part By the term stabilizing operation is meant one which limits the untoward motion in one or more of the ankle joints in such a way that weight bearing and walking in the physiological position will be restored and the deformity when once overcome by corrective operation, will not tend to recur Therefore simple tenotomies and tendon transplantations are not discussed, consideration being given only to the following standard operations

1 Arthrodesis, either after the manner of Soule (astragalo-navicular) or Ryerson triple arthrodesis" (astragalo-navicular calcaneo-cuboid, calcaneo-astragalar) and the subastragalar arthrodesis of Davis.

2 Astragalectomy with backward displacement of the foot after the method of Whitman and horizontal transverse tarsectomy with backward displacement of the foot after the method of Davis It is generally agreed that for cases of lateral disability in which there are good calf muscles and the foot is more or less in equinus, arthrodesis is best and in some cases this may be combined with fasciotomy corrective wedge resections, and appropriate tendon transplantation

For the completely flail and dangle foot or lateral instability combined with calcaneus, the Commission found that the vast majority of operators prefer Whitman's astragalectomy In connection with astragalectomy various forms of tendon transplantation or tenotomies for the correction or the avoidance of unfavorable positions may be necessary

The consensus of opinion is that astragalectomy is not indicated in pes equinus or in ordinary lateral instability when there are good calf muscles. In comparing the Davis horizontal transverse section with that of the Whitman astragalectomy — the two operations of choice for the same deformity — the Commission recommends the Whitman operation on account of the fact that the Davis operation is not clearly surgical and the posterior displacement of the foot is very difficult to obtain

The conclusions drawn are summarized briefly as follows

1 Metal plates, wires, screws, nails, silk ligatures, and bone grafts are objectionable and unreliable

2 Arthrodesis gives excellent results in lateral instability, especially where there are good calf muscles. The best results are to be found after the triple arthrodesis of Ryerson or the subastragular arthrodesis of Davis. Arthrodesis of the ankle joint is rarely indicated

3 Astragalectomy with backward displacement of the foot, when done after the method of Royal Whitman, for (1) calcaneus, calcaneo-valgus, etc.,

(2) for dangle foot, and (3) for lateral deformity, gives by far the best results. In some cases the results have been so perfect and the foot so symmetrical that it would have been difficult to tell that the foot had been operated on if the scar was not seen.

4 Horizontal transverse tarsectomy after the method of Davis gives, as a whole, results inferior to those obtained by the astragalectomy and is a more difficult, bloody, and less scientific operation.

5 The use of living ligaments after the method of Gallie Putti, Peckham, and others has given

tion the fixation was done after the ordinary tendon transplantations had failed, and it would seem that the place for tendon transplantations is as an adjunct to a stabilizing operation.'

F W Carruthers M D

SURGERY OF THE SPINAL COLUMN AND CORD

Hill R. **Laminectomy for Meningitis.** *Surg Gynec. & Obst* 1921 xxxiii, 283.

The author states in meningitis, especially that of streptococcic or staphylococcic origin, which is often fatal, death is due to two factors, increased tension and toxemia. The advisability of performing a laminectomy with free spinal drainage in certain classes of cases is worthy of our consideration. A case of Downes is reported in which meningitis followed fracture of the skull. Severe symptoms developed, including high blood pressure and marked leucocytosis. Occipital decompression above the foramen magnum was done and the dura over both sides of the cerebellum and cerebrum was incised. Fluid escaped, and the patient recovered. The author reports also two of his own cases

Case 1 The patient was a man 40 years of age An operation was performed to remove a bullet from the ethmoid bone. The orbital plate of the ethmoid was found broken and some brain tissue came away with the fragments. One week later the patient became delirious, his temperature rose to 101 degrees, and at the end of two weeks he developed all the symptoms of meningitis. The spinal fluid was loaded with pus. Laminectomy was performed, the spinous process and lamina of the third and fourth lumbar vertebræ being removed The dura was exposed for an inch and incised. Some of the symptoms persisted for a time but in one week the rigidity and high temperature had disappeared. In two weeks the mental symptoms disappeared. Entire recovery was slow but uneventful

Case 2 The patient was a man 27 years of age. Meningitis followed otitis media. The diagnosis was made on October 23 October 24, 3 ox. of spinal fluid were withdrawn. A laboratory report showed no organisms but a high polymorphonuclear cell count. October 28 the patient was in stupor with profound meningitis his temperature was 101.4 degrees and his pulse 134. Laminectomy was performed in the region of the second and third lumbar vertebræ. When the dura was opened only a few drops of clear fluid escaped. A pointed instrument passed upward encountered dense adhesions and caused a gush of about 20 c.cm. of whitish pus A rubber drain was inserted and the wound closed The temperature dropped to 100 degrees but the patient was delirious and died two days later

The author believes that operation is indicated in cases of streptococcic and staphylococcic meningitis Recovery has followed repeated spinal puncture and it seems rational to assume that laminectomy should yield infinitely better results if it is done before the cerebrospinal channels are blocked by inflammatory products and adhesions.

Frank G Murphy M.D

Pybus, F C.: **Spina Bifida.** *Lancet*, 1921 ccl 599

The author defines spina bifida as a congenital defect of the vertebræ, usually the posterior arches, which in most cases is associated with protrusion of the spinal contents. The defect occurs about once in 1,000 infants

The different types of spina bifida met with clinically are best understood by a study of the develop-

and the vertebræ which are first laid down in cartilage and later become ossified A defect in any one of these stages may cause some type of spina bifida.

Spina bifida is occasionally a family defect, as illustrated by its occurrence in four children in one family cited by the author

Spine bifida occulta, the mildest form occurs when there is a defect in the vertebral arches without the protrusion of spinal elements. The defect is usually symptomless, is shown by a scarring or depression in the midline, and may be covered by a small hair field. Occasionally a mild scoliosis develops at the site of the defect.

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or may be thin walled pedunculated and sessile.

The meningo-myelocele is a protrusion of the membranes and contains some of the cord elements. It is the most common form and is larger broader and usually more translucent than the meningocele The cord may open on the surface of the protrusion as a red ulcerated area.

The syringo-myelocele resembles the meningo-myelocele, but the central canal of the cord is dilated.

and the formation of a dense scar Fine beeswaxed silk is recommended.

Primary suture should be attempted in all cases of incised nerve injuries even if infection supervenes, as it will keep the cut ends from separating widely

In cases of injury due to rapidly moving missiles the nerve changes are more marked so that it is often necessary to resect greater portions of the injured nerve before normal funiculi are found Even when large sections of nerve are removed suture can usually be accomplished by mobilization of the nerve segments displacement of the nerve, and suitable posture.

The advantage of primary suture is that no neuroma forms on the nerve In cases of long delay a neuroma may be very large and necessitate wider resection.

The distal segment undergoes very little change, even after several years

In secondary suture it is important to resect the

the return of motion

The after treatment is of great importance The paralyzed muscles should not be overstretched nor yet allowed to atrophy Rigid splinting is contra-indicated

Trophic changes are often the direct result of trauma such as cigarette burns of the fingers and pressure on the toes and heels

Suture of the musculospiral nerve gives the greatest number of successful results with return of function as early as five and a half or six months After suture of the internal popliteal nerve, function *may return as early as seven months, which* is earlier than it returns following injuries of the external popliteal nerve.

Median-nerve suture gives good results. Following repair of the ulnar nerve the results are not often very good and motion is sometimes delayed for two years. MARCUS H. HOBART, M.D

Kre[illegible]

J ortlop u Unfallchir 1921 xix 231

On the basis of thirteen cases Kreuz recommends

used by Selig he prefers Pfannenstiel's suprapubic incision In the after-treatment the legs are kept somewhat spread apart for fourteen to eighteen days by means of a plaster cast. Active and passive abduction and adduction movements are then begun

With regard to the permanency of the result Kreuz states that the time since the operation in the cases reviewed has been too brief to warrant an opinion

KREUZ (Z)

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Von Redwitz, E. F: The Surgery of Influenza (Die Chirurgie der Grippe) *Ergebn d. Chir u Orthop* 1921 xiv 57

This article is a collective review with a bibliography of 1 117 references In the introduction the nature, pathogeneses, etiology symptomatology and pathologic anatomy of influenza are discussed. The author then takes up the surgical complications The surgery of influenza in the last two large epidemics was really the surgery of pyogenic in-

cases critically It must be borne in mind also that at the time of the influenza epidemic pyogenic bacteria were more numerous in our surroundings and the tendency to fever processes was therefore greater

Most frequent were the complications following influenza of the respiratory tract. In this connection the author discusses in detail the treatment of influenzal empyema Routine treatment, he states, is to be condemned. Close clinical observation and great care are essential for the rational care of this condition In the opinion of most surgeons resection of the ribs should be delayed and only aspiration should be done until the pneumonic symptoms have disappeared and the heart has become stronger.

In the treatment of the pyogenic processes the epidemic suggested nothing new The value of wound antisepsis according to the Carrel-Dakin method or by means of the quinine derivatives used by Morgenroth has not yet been established

STAHL (Z)

SERA, VACCINES, AND FERMENTS

Eyre J W H and Marshall C H : A Case of Trypanosomiasis Treated by Intrathecal Serum *Brit M J* 1921 II 284.

A detailed report is given of the case of a patient with sleeping sickness who was treated by the injection of serum into the spinal canal. Infection was

to be malaria which lasted for about five days, his temperature ranging from 102 to 103 degrees F Quinine was given but was not effective. The last of several irregularly recurring attacks occurred August 23 and 25. At this time an examination of the blood showed the presence of T gambiense.

When the patient was seen by Marshall, September 24, he was suffering from malaise, vomiting, pain in the back, and headache. There had been marked loss in weight. Examinations of the peripheral blood showed two to three trypanosomes to a field. An intravenous injection of 0.9 gm. of neokharsivan was given half an hour later 20 c.cm. of blood were drawn and allowed to stand for twenty four hours in a sterile container At the end of that time a solid clot had formed. In this way 12 c.cm. of clear serum were obtained. The following day after 15 c.cm. of cerebrospinal fluid had been removed by spinal puncture, the 12 c cm. of serum were injected into the spinal canal. For two or three days the patient suffered a severe reaction, but following this convalescence was rapid.

Two weeks after the injection, examinations of the blood for trypanosomes were negative, although one of three animal inoculations was positive. Since the patient showed apparent recovery clinically, no further treatment was given. All subsequent blood examinations and animal inoculations with blood or cerebrospinal fluid were negative. No treatment was given other than the one injection of salvarsanized serum. The use of intrathecal serum was based partly on the theory that during treatment the blood forms definite antibodies (trypanolysins) as a result of the presence of the dead protoplasm of the trypanosomes.

Since infection with trypanosomes usually leads to an invasion of the central nervous system, Marshall and Eyre emphasize the necessity for routine intraspinal treatment as a curative measure It should be used also as a prophylactic measure if such an invasion has not already taken place. They report that eight other patients who were given a single injection of serum were well at the end of one and one-half years. A careful investigation of this treatment in countries where this disease is common is urged. E G JACKSON M.S

BLOOD

Hartman, H. R : Blood Changes in a Gastrectomized Patient Simulating Those in Pernicious Anaemia. *Am. J M Sc.* 1921 clxii 201

The author reports a case of complete gastrectomy performed at the Mayo Clinic in which recurring anæmia, weakness and some of the pathologic changes seen in pernicious anæmia were noted

The patient a man aged 58 years, had been sick at intervals for fifteen or twenty years. His chief complaint was dull heavy pain in the epigastrium after meals, with distressing hunger before meals, relieved by food or drink. A diagnosis of peptic ulcer with possible malignancy was made because of the recent loss of 15 lb in weight and a rapid decline in strength

The blood pressure was normal. The findings of the blood examination were hemoglobin 80 per cent, red blood cells 5 520 000 white blood cells 8 200 and color index 0 7+ No differential count was made. Single analysis of the stomach contents one and one-half hours after a modified Ewald meal revealed a residue of 120 c.cm. no free hydrochloric acid, total acidity 4. The roentgenologist reported an indeterminate pyloric lesion

Operation performed in August, 1917 revealed a movable carcinomatous ulcer on the posterior wall of the stomach extending to within 4 cm of the œsophagus. A total gastrectomy was performed and about 1 cm. of the œsophagus removed, the end of the œsophagus was sutured to the lateral wall of the jejunum about 45 cm. from its origin. There was very little glandular involvement.

The patient returned to the Clinic ten months later having lost 7 lb He then complained of epigastric pain, heart burn, and excessive salivation after meals. He was taking three fair sized meals a day and milk between meals. As his condition appeared favorable, no laboratory tests were made.

Eleven months later he again returned, having grown progressively weaker He complained of regurgitation after meals, which, if continued resulted in regurgitation of bile. The blood picture was that of pernicious anæmia the hæmoglobin ranged between 53 and 55 per cent, the red cell count was 2,000,000 and 2 280,000, the white cells varied between 2,200 and 7 600 The color index was constant at 1 2+ The red cells showed increased resistance. The Wassermann reaction and the neurologic examination were negative.

A year later the patient returned in a still weaker condition. The recrudescences and remissions of his anæmia were of shorter duration than is usual in pernicious anæmia, while his health suffered a general decline. The only foods which caused distress were meat and fresh bread. Examination of the eye grounds was negative. There was moderate œdema of the legs. The hæmoglobin was 48 The red cells numbered 1,420 500 to 1,880 000 and the white cells 4 000 to 4 700 The color index was 1 2 to 1 6+ Anisocytosis was moderate and poikilocytosis and polychromatophilia were slight. The Wassermann reaction was negative coagulation and calcium times were eight minutes. There was increased resistance of the red cells

The author suggests that this case while of no significance in itself might give some clue as to the etiology of pernicious anæmia. It suggests that the

selves be hemolytic or detrimental to the blood-forming organs Pernicious anæmia is invariably associated with achylia.

A review of the literature showed only one case of complete gastrectomy which had been followed for any length of time This patient, whose case was reported by Moynihan, was well for three years after the operation, when he began to show evidences of profound anæmia, became pale and breathless, and lost weight. He gradually failed and died in eight months. Necropsy showed no recurrence of malignancy, there was no dilatation of the jejunum at or near the site of the anastomosis. All the organs exhibited an extreme anæmia the blood in the heart and great vessels was watery The liver was pale and somewhat fatty The spleen contained a large and very old infarct The heart muscle was pale and flabby

O S Procror, M D

Mayo, W J : Pernicious Anæmia, with Special Reference to the Spleen and the Large Intestine *Ann Surg* 1921 lxxiv 355

The etiology of pernicious anæmia is unknown the early symptoms are indefinite and by the time a diagnosis can be established the condition is incurable.

The relation of the spleen to the formation of the blood led the earliest observers of pernicious anæmia to suspect that the spleen was associated with the disease. It remained for Epplinger to suggest that the removal of the spleen might cure, and early reports give testimony of temporary relief after splenectomy sufficient to justify a fair trial of the operation. In the cases observed in the Mayo Clinic there was a marked gain in weight, an improvement in hæmoglobin on an average from 36 to 72 per cent, and an increase in the red cell count on the average from less than 2 000,000 to more than 4,000 000

Previous to November 1, 1917, fifty splenectomies were performed in the Mayo Clinic for definitely established pernicious anæmia The operation was then almost entirely discontinued for this condition for three and one-half years as there was not sufficient evidence that it would effect a cure and at that

studied the condition of these fifty patients. They found that 21 3 per cent of those with pernicious anæmia survived the operation three years or more

ly indicates that in at least one-third of the cases the average life of patients with pernicious anæmia is greatly prolonged, and in about 10 per cent the prolongation is sufficient to lead to the hope that in some cases cures may result. In certain early cases of a type not as yet fully recognized splenectomy offers a possibility of cure. Not only is this true, but also in the average cases the palliation following splenectomy is much greater than that obtained by blood transfusion.

One of the functions of the spleen is to destroy deteriorated red cells. Apparently in pernicious anæmia the red cells are born feeble and the spleen sacrifices red cells which, although imperfect, are the best the patient can produce and are capable of functioning. Removal of the spleen stops this destruction, but does not greatly affect the disease otherwise The cases which seem to be most favorable are those in which hæmolysis is most active and those least characteristic of the disease It also seems very certain that the prospect of benefit is better in early than in late cases When the disease has advanced to the point at which the bone marrow has been injured beyond the power of recuperation the most to be expected is a temporary abatement of the symptoms

The operation of splenectomy for pernicious anæmia is simple Three deaths occurred following operation on the first nineteen patients Operation was performed during crises as a last resort in very advanced cases. The best plan is to give one or two transfusions in order to get the patient on the up-grade before operating and not to operate during a crisis. No operative deaths have occurred in the last forty cases.

Many observers have expressed the belief that toxic materials from the gastro-intestinal canal are the cause of pernicious anæmia In a former communication the author discussed the physiology and pathology of the right half of the large intestine, his interest being excited primarily by the frequency of surgical tuberculosis and carcinoma of the large intestine and further by the work of Lane on intestinal stasis. Carcinoma or tuberculosis of the proximal half of the large intestine produces an anæmia unexplained by hæmorrhage which is much more severe than the anæmias of carcinoma or tuberculosis of any other part of the body Experience with a large number of resections for the relief of anæmic patients in wretched general condition with œdema of the extremities, etc. has shown a comparatively low mortality and a high percentage of permanent cures

Some very interesting observations on balantidium coli as the cause of blood and cord changes of the pernicious anæmia type have been made by Logan of the Mayo Clinic, and in a certain degree the cases studied support the hypothesis of the intestinal

origin of pernicious anæmia The balantidium coli is a flagellate parasite which rarely inhabits the intestinal tract of man, but is common in the pig In any event the pernicious anæmia of balantidium coli progresses to a fatal issue

There is not much evidence that the etiological agents of pernicious anæmia arise in the large intestine. The blood conditions of all patients who have disease of the large intestine must be studied to ascertain whether anæmia, achlorhydria, glossitis, or some other abnormal condition exists, and especially to study with care from this standpoint all cases in which the large intestine is removed or splenectomy is performed.

BLOOD AND LYMPH VESSELS

Fitzwilliams, D C. L. Nævi in Children and Their Treatment *Practitioner* 1921 cvii 153

This article is based on the results obtained in more than 700 cases in which careful notes were kept and on 300 additional cases without notes.

A nævus is defined as a blood vessel tumor growing by the formation of new vessels. Probably all nævi start in an increased growth of the ordinary capillaries, new
as capillaries f
lanes are crow
stitial tissue between them In deeper tissues the capillaries at times run together when the fine septa between them break down and cavernous spaces form The older the nævus, the more apt this is to happen As long as a nævus is spreading it is surrounded by a band of spreading actively-growing capillaries.

The only classification of value is one based on position. Nævi in the skin and mucous membranes are cutaneous mucous, or superficial those in the deeper structures are subcutaneous and those in both are transitional Of 853 nævi noted 58 per cent were superficial, 35 per cent transitional and only 8 5 per cent subcutaneous. As superficial nævi spread to the deeper tissues, many transitional nævi have been superficial at some time.

The cause of nævi is not known They are seen only in fat healthy infants Their incidence is 65 per cent in females and 34 per cent in males

Fitzwilliams states that in his experience they are nearly all present at birth

They occur on the head and neck as often as upon the rest of the body The long axis of the nævus will always be found to lie in the same direction as the nerve which supplies the part. Nævi appear near the place where the nerves become cutaneous.

Some disappear spontaneously later in life.
Some ulcer[illegible]

The cutaneous nævus should be treated without delay before it has had time to invade the subcutaneous tissue In the early stages it may be destroyed by carbon dioxide snow If it is large it may be necessary to apply the snow in two or three places Care must be taken that the frozen areas do not overlap and the process must be repeated in order to deal with the untreated areas.

Excision is equal in every respect to the use of carbon dioxide snow but must be carried out carefully if scars are to be avoided. Electricity is not so suitable for these cutaneous cases and is much inferior to the other methods mentioned.

Excision is the best method of treating the subcutaneous and transitional types The next best is the use of the heat cautery preferably the Paquelin type. The author describes the technique of excision and the use of the heat and electric cautery in detail

The series of cases reviewed did not include the small spider marks or so-called nævoid conditions. The treatment for these is very similar

CARL R. STEINKE, M.D

Alglave P : The Surgical Treatment of the Varicose Ulcer (Au sujet du traitement chirurgical de l ulcère variqueux) *Bull et mém Soc de chir de Par* 1921 xlvii 945

On the basis of [illegible]
during a period o
that total resectio
curative or preventive treatment of varicose ulcers.

Experience has shown that the Moreschi Reclus treatment of varicose ulcer (interruption of the blood column which distends and alters the venous walls by
is
ple
varicose vein.

2 Such an ulcer begins where a diseased vein adheres to the skin.

3 The presence of a varix threatens the further development of ulcers in addition to those already present.

4 Total resection of varices is a rational method of removing the mechanical causes which increase the blood pressure in veins already diseased or in those predisposed to varicosity Such predisposition may be congenital or acquired.

Of seventeen of the patients operated upon by Alglave fifteen have remained cured, one for eight years, six for fifteen years, two for four years, three for three years, and three for two years. Recurrence was reported in two cases both of which were cases of complex ulcers.

matic or secondary varix to which other factors are added. In the latter the limb may have been formerly affected by phlebitis or there may have been a frac

ture or other traumatism more or less seriously involving the veins The simple varicose ulcer is more often amenable to surgical treatment than the complex ulcer W A Bardeman

SURGICAL DIAGNOSIS PATHOLOGY AND THERAPEUTICS

Llaterri, P: The Chemistry of Traumatism (Química del traumatismo) *Rev méd de Sevilla* 1921 xl,1

Proteolysis following trauma is a purely digestive function which is limited in its scope The agent charged with tissue proteolysis is the polynuclear leucocyte This is digestive not phagocytic, as it destroys the tissues by its trypsin The leucocyte activity in the production of trypsin ceases when all necrotic tissues have been digested and eliminated

Just as there are certain bacteria which favor intestinal digestion, so also in open wounds there are those which favor proteolysis without intoxicating the organism The sporogenic bacteria are the most active in proteolysis and associated micro-organisms appear only when most of the proteo-

[illegible] by dead cultures of streptococci will be freed from active streptococci The efficacy of such treatment was proved during the war The auto-vaccination of wounded tissue opens up a new field of surgical investigation and therapeutics W A Bardeman.

Waterman, N: Serodiagnosis of Carcinoma (Die Serodiagnostik des Carcinoms) *Nederl Tijdschr v Geneesk.*, 1921 lxv 197

The [illegible] methyl-alcoholic extract of normal dog pancreas or acetone extract of lecithin preparations.

After testing the reaction upon normal serum Waterman uses the serum of the cancer patient In counting the drops he employs the electric bell counter of Traube The blood is obtained from the patient in the morning before he has had any food The serum separates at room temperature and is kept in the ice box for two days at 5 degrees C Before the test is made it is kept at room temperature for two hours and is then mixed with the antigen. The vessels and tubes must be kept free from alkali and fat

From a series of 108 cases the author concludes that on account of the uncertainty of the antigen Waterman believes that at present the method is a strictly laboratory procedure and not practical for general use in the clinic Dudgeon (Z)

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Wilson, L. B. Dispersion of Bullet Energy in Relation to Wound Effects *Mil Surgeon* 1921 xlvi, 24

Very puzzling effects are often caused by the entrance of missiles into tissue A great, jagged wound of entrance may be made by a shell fragment which has penetrated only a short distance, yet has caused injury only an imperceptible distance from those parts actually touched in its course. The entrance wound may be almost imperceptible yet internally the tissue is pulped at a distance of more than 1 cm from those portions actually touched in passage A study of this kind must be confined to missiles of regular form and approximately known velocities

Missiles of high velocity arouse the greatest interest Although bullets of 1 600 to 2,000 f s velocity were used in the Revolutionary War there is no authentic record of wound production by these missiles With the Civil War bringing out the necessity of rapid fire, cartridges were substituted for the older methods, and these reduced the velocity to about 800 f s. Not until the copper jacketed bullets and smokeless powder came into use could [illegible] wound 1875 made observations, including Sir Victor Horsley in England and Colonel Lagarde in this country Most of the observations were made on the bodies of men and animals, though some were made on cans containing water clay marble, etc Although these studies were made on missiles of about 2,000 f s. velocity while those of today are from 2 500 to 3,000 f s they are important because at long range the highest velocity missiles fall to velocities of those of the older type

Very few purposely deformable, and still fewer truly explosive bullets were used by any European nation during the recent war The fact that explosive effects were so rarely seen during the Spanish [illegible] when undeformed and flying true or when deformed and flying erratically

The principal explosive effects" produced by undeformed high velocity rifle bullets flying head on are comminution of bone the "blasting out

of high velocity will pass cleanly through. Missiles which strike bones of high density are followed by less local shattering than those which strike bones of lower density—the shafts of long bones less than the head etc.

The variation in the effects of "blasting out" of soft tissues at the point of exit is explained largely by a consideration of secondary missiles that is the

[illegible] rly
he
gh
[illegible] bullets.

Most of the experiments conducted previous to those made by the author had been on dead bodies sand clay etc. which do not readily lend themselves to an accurate determination of the distance to which the energy of high velocity missiles may be transmitted. The author chose gelatin as the most suitable medium because of its translucency and easily controlled densities. This report is merely preliminary as the experience of war has opened up many ramifications of the problems involved.

Gelatin was used in densities of 5 10 15 and 20 per cent, and was molded into blocks 3½ by 4½ by 2 in. The masses were fired through at a standard range of 50 ft., using the regular charge in a Spring field rifle. In addition to observing the shattering of the gelatin masses, various other means were taken to measure variations in the dispersion of energy These included powdered charcoal on the surface or in a small area in the center of the mass and threads or delicate silk net embedded in the gelatin

Summing up the results without any attempt at high mathematical accuracy it is shown that the energy of a high velocity missile passing through gelatin of different percentage densities is dispersed in an explosive degree to distances approximately inverse to the squares of the percentage densities. These experiments have been supplemented by similar studies on living and dead animal tissues and by observations of fatal war wounds. So far as one can estimate the relative densities of tissues, the principles worked out for gelatin seem to hold for cartilage, fibrous connective tissue, muscle masses, and soft glandular organs. It has been

[illegible]

destruction of soft tissues even when no bone has been struck, at distances much farther from the track of the missile than one would expect as much as 1 cm. This necessitates wide débridement of the track of the bullet. One must also not lose sight of the great evulsive effects of the missile in ripping out fibers of connective tissue particularly from muscle aponeuroses and the sheaths of vessels and nerves.

Another point is that the softer the organ or tissue, the further away from the track of the missile will serious secondary results of injuries occur. Soft glandular organs such as the kidney spleen, and liver, and the nerve trunks, which have not even been touched by high velocity bullets may be seriously affected by the transmission of energy to them through intervening soft parts.

Another striking result is the production of minute injuries to the intima of blood vessels due to the transmission of energy through a medium of low density and viscosity The gelatin experiments seem to indicate that the transmission of explosive energy is related more directly to variations in viscosity than in density that is, the less the

[illegible]

minute slit like lesions of the intima which may be scattered far away from the parts actually touched are almost certain to occur and these lesions in the intima even if uninfected, may cause thrombosis, fatal secondary hemorrhage, or slowly developing aneurisms. The lesion may also be a focus for bacteria in the blood stream. When a bullet has passed completely through and out of the body or limb indicating its relatively high velocity and either through or in close proximity to an important blood

[illegible] ine the tissue is evid
distance from the
ate surgical proced
ure is ligation of the vessel at a relatively great distance from the track of the missile.

O. S. Procter, M.D

Fromhold E. E. and Nersessoff N.: Artificially Produced Jaundice (Ueber kuenstlich erzeugten Ikterus) *Referativny Medicinsky J.*, 1921 1 163

Jaundice can be produced experimentally either by ligating the cystic duct or by poisoning the animals experimented upon. It is possible also that it might be produced by the direct introduction of bile pigment into the blood. To throw light on this question the authors introduced a solution of bilirubin in caustic soda into the auricular veins of rabbits. The bile pigment was shown to be toxic if too large a dose, i. e. more than 0.1 gm was introduced the animals died with diarrhœa and cramps. When the dosage was carefully regulated death did not take place even after repeated injections.

In spite of the fact that large quantities of the deep-staining pigments were introduced, no very pronounced discoloration of the sclera, skin, or internal organs was noted in any case, and in only a few was a slight yellow color observed. In no case was Gmelin's urine reaction positive. The behavior of dogs in this respect was quite different. Two experiments on dogs showed that the kidney is readily penetrated by bilirubin, but in these animals also there was no general jaundice.

[illegible] he production of sterile

tissues.

The conditions under which bilirubin is able to pass through the kidney are not yet fully explained As was demonstrated by the authors' experiments, this may occur in rabbits when the cystic duct is ligated The experiments showed also that albumin frequently appears in the urine, as is often noted in clinical cases of jaundice (hyalin casts and traces of albumin)

If bile pigment is repeatedly introduced into the blood of the rabbit, urobilin and urobilinogen in large quantities soon appear in the urine. This sign is constant and always very pronounced

The experiments reported were the first in which an artificial urobilinuria was produced.

Von Hoist (Z)

Inlow W D : The Spleen and Digestion. *Am J M Sc* 1921 clxi, 325

From the earliest times the spleen and the stomach have been supposed to possess some close interrela tionship Baccelli, in 1868, demonstrated a gastro-splenic circulation through the vasa brevia and first put forward the theory that the spleen plays a rôle in the elaboration of pepsin. Subsequent studies of this question have been made on dogs by testing gastric secretion before and after splenec tomy This has been done by means of gastric fistulæ Pawlow pouches, and the removal of secre tory meals through the stomach tube Similar studies on man have been made by gastric analyses after splenectomy The results of these experiments, which have been contradictory may be summarized as follows

1 Removal of the spleen causes a diminution of the proteolytic power of the gastric juice

2 The injection of splenic extracts, of leucocytes, and of extracts of lymph glands increases the proteo-lytic power of the gastric juice of splenectomized animals.

3 Removal of the spleen causes an augmentation of the proteolytic power of the gastric juice

4. Removal of the spleen has no effect whatsoever on gastric secretion

The chief theory put forward by the first group of investigators was that during digestion the spleen gives to the blood stream a substance which acti-vates or leads to the further elaboration of the gastric enzymes, especially pepsin.

In this experimental study Inlow reports data concerning the gastric secretion findings before and after splenectomy on three dogs with accessory stomach pouches (secretory meal of meat) and on two similar dogs serving as controls Removal of the spleen in [illegible] caused no change either

mental inquiries and a critical review of the litera ture that a definite pepsinogenic function of the spleen has not been demonstrated and that the relation of the spleen to gastric secretion is probably merely vascular the diminution in the amount of juice secreted after splenectomy being attributable to a decrease in the gastric blood supply due to injury to the gastro-splenic circulation.

ROENTGENOLOGY AND RADIUM THERAPY

Morrell, R. A.: Some Effects of Radiotherapy upon Fibrous Tissue. *Arch Radiol & Electrotherapy* 1921 xxvi, 75

Although too few cases were treated to warrant definite conclusions regarding the value of the method the results obtained were sufficiently en couraging to warrant a more general application of it There was one feature common to all the successful cases The symptoms complained of were due to the ill effects of fibrous tissue. This scar tissue resulted from operative measures rather than from the actual wounds received in action the tissue was therefore young rather than adult tissue. In two of the unsuccessful cases the reverse con dition was present the tissue was of a much older nature and due to some form of fibrositis.

Four groups of cases were treated Group 1 com prised cases of brachial plexus injury with marked scar tissue. The two cases of this group received decided benefit from radiotherapy In Group 2 three cases of sciatic nerve involvement were greatly improved but two others in which there was a fibro-sitis of long standing failed to show improvement.

a single case of painful nerve bulb in which the treatment proved very successful. Four cases of extensive superficial scars with pain due to in-volvement of nerve endings received no benefit from radio-therapy

In all of the cases treated successfully by radio-therapy other methods had been used previously with little or no improvement. The benefits derived manifested themselves by a decrease in the limita tion of movement and alleviation of the pain The scar tissue became softer and more pliable.

As regards the technique employed, the author states that a 16-in coil and Coolidge tube were used, the parallel gap was 9 in., the current, 3 ma. the

The treatment was given at intervals of three days. The number of treatments varied.

The histories of the various cases are reported in detail

Adolph Hartung, M.D

Ewing, J : Tumors of Nerve Tissue in Relation to Treatment by Radiation. *Am J Roentgenol* 1921 n s viii 497

In general, the structural characters which deter mine susceptibility to radiation are cellular an undif ferentiated form of the cells rapid growth with abundance of mitoses vascularity especially when

entiated and adult in type, when they grow slowly and mitoses are few, when the blood supply is through well formed adult vessels, and when there is much intercellular substance Considering the tumors that affect nerve tissue—in the brain meninges, spinal cord and peripheral nerve trunks—one finds very wide variations in the particulars mentioned and if the rules hold, similar variations in the response to radiation should be expected.

Neurofibroma and neurosarcoma belong structurally to the class of non-susceptible tumors accordingly one finds that these tumors are exceedingly resistant to all forms of radiation in any dosage that can be applied safely through the skin Of the endothelioma psammoma or sand tumor offers great resistence to radiation unless radium is applied directly to the growth or is inserted within it. Rarely vascular and cellular endotheliomata are encountered which may be more susceptible, but whenever the cells are of adult endothelial

True ielioma should
be mo as far as the
tissue be markedly
influen trition is very

unstable, but whether a slow and safe regression can be effected appears doubtful, especially when the tumor is bulky On the other hand as very few successful surgical removals of such growths have ever been accomplished experimentation is justified Of all tumors of the brain and spinal cord glioma in its various forms presents most of the structural features that favor susceptibility to radiation. Primary carcinoma of the brain structurally indicates a high degree of susceptibility to radium However this and other tumors springing from the ventricles or pineal gland is well protected by distance from the attack by radiation The very delicate structure of such growths, however encourages the hope that they may in some instances be favorably influenced by the physical agents

Of the group of hypophyseal tumors, cysts offer no encouragement for radiation therapy Chronic hypophyseal struma with acromegaly has been definitely influenced by roentgen rays directed through the temporal regions. It is the author's belief that success will eventually be attained by exposing these tumors for direct radiation or by inserting minute quantities of radium within them. It cannot be said that hypophyseal struma, being a form of functional hyperplasia, is very susceptible to radiation. The cellular adenocarcinomata are more so In either case the bulk of the tumor should render the insertion of radium a safe procedure if infection can be avoided

The hypophyseal duct tumors belong in the class of basal-cell carcinomata and should respond well to radium The slow course of most hypophyseal growths and the peculiar clinical symptoms due to functional disturbance of the endocrine system constitute very delicate indicators of any therapeutic effect that may be produced upon them and render this field of unusual interest in radium therapy

The successful and safe use of radiation in the treatment of intracranial and intraspinal tumors is dependent upon getting a sufficient dosage to the tumor [illegible]

t [illegible] tumors can be delivered through the adult skull to all portions of the brain can be shown by physical computation and has been demonstrated experimentally by the work of Bagg on dogs and monkeys. Whether such dosage will prove sufficient to bring any of these tumors to a standstill or to definite regression can be determined only by experiment on the human subject. In children the comparative thinness of the skull the smaller size of the brain and the more frequent occurrence of cellular tumors suggest that external radiation should be employed before other methods are used.

Another factor which deserves consideration is the increased intracranial pressure which is usually associated with brain tumor Full radium dosage may be expected to produce hyperæmia, an increase of intracranial pressure, and probably some œdema before it can cause any definite recession in the bulk of a tumor Therefore unless the patient can withstand a certain temporary increase in the pressure, the application of radium may be followed by aggravated symptoms.

When the tumor can be exposed, it becomes accessible t or to
the inserti last
method is thout

regard to the structure of the tumor but is accompanied by the danger of infection and the risk of injury to normal brain tissue. If radium needles are to be used it is highly important that the tumor tissue should not be disturbed by partial excision as it acts as a filter protecting the normal unaffected areas. The practice of attempting to remove as much as possible of the tumor and then turning the case over for radium treatment generally assures failure and discredits radium therapy With few exceptions, surgery should be used only to expose the growth when a brain tumor is to be treated with radium Cordial cooperation and mutual understanding between the surgeon and radiologist are essential if success is to be achieved in this field.

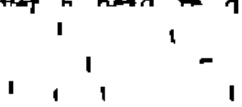
ADOLPH HARTUNG M.D

Bettman, R. B : The Removal of Embedded Needles in Broad Daylight with Intermittent Fluoroscopic Control *Surg Clin N Am* 1921 I, 1163

The author describes an operating fluoroscope he has devised with which he is able to operate in

broad daylight and have at hand the mean of obtaining fluoroscopic aid without danger to asepsis

This fluoroscope is similar to the hand fluoroscope in common use. It fits snugly against the operator's forehead and cheeks so that when the screen is down it is light tight It weighs very little Th[illegible] The screen



lary accommodation is raised before the operator's eyes. A young man or one with good accommodation to light can dispense with the red glass.

Lead glass like that used for the fluoroscopic screens in common use is placed at the base of the hood to protect the operator The screen is the usual fluoroscopic screen.

When the screen is opened the surgeon has direct vision. When the screen is closed he can see the fluoroscopic images exactly as if he were in a dark room using an ordinary fluoroscopic screen. After the fluoroscope has been adjusted to the head it is covered with a sterile cloth through which the screen can be manipulated.

The usual fluoroscopic table with the under table sliding tube box installed in every X-ray department is amply sufficient.

Bettman describes the use of this fluoroscope in detail in the removal of a needle fragment embedded in the hand FRANCIS CARMODY, M D

Carter L. J.: The Treatment of Tuberculous Cervical Adenitis: Results from the Use of Fractional X Ray Dosage in One Hundred Cases. *J Radiol* 9: 1 n, 52

The author believes that the roentgen ray can cure any tuberculous cervical adenitis that surgery can remove and do it with less discomfort to the patient and less danger of spreading the infection. The only indication for surgery is given when a caseous gland has broken down as the result of secondary infection or through liquefaction necrosis and is pointing toward the skin In such cases the detritus or the pus should be evacuated by the smallest skin incision.

The aim in applying roentgen therapy should be to imitate nature's method of producing a cure A study of the pathology of tuberculous glands and the changes occurring in them during the healing process reveals a hyperplasia first of the lymphocytes and subsequently of fibrous tissue elements. Treatment should be applied with a view to stimulating these defensive forces rather than to causing [illegible]

confirmed by several unfortunate experiences in which glands were given highly filtered intensive treatment and the condition was aggravated rather than alleviated The good results obtained in sanatoria with heliotherapy also speak for the value of stimulation Above all, the uniformly good results obtained in one hundred cases treated by rays of medium penetration are convincing proof of their value

As regards the technique advocated Carter states that the rays used were as soft as was consistent with thorough penetration and safety to the overlying tissues A 2 mm aluminum filter was used Rays backing up a 5 in parallel spark gap were applied at a 10-in focal distance for a period of five minutes, a 4 m.a current being used. This gave approximately a skin dose underneath the filter or seven-eighths of a skin dose in the glands One such treatment was given every five to seven days until there was a marked decrease in the size and inflammatory condition of the glands The usual number of treatments necessary was eight to ten. The interval between treatments was then extended to two weeks and they were continued thus for a period of six to nine months The patients in this series who continued the treatment until

forms of tuberculosis were carried out. Of cardinal importance was the hypodermic use of tuberculin at a dosage short of producing a systemic reaction The possible existence of foci of infection should be borne in mind, and if they are located they should be promptly eradicated

In one of the early cases of the one hundred upon which this report is based, telangiectasis was produced where an erythema of the skin occurred During the course of the treatments about ten of the glands broke down and required evacuation This was done through a very small skin incision, which promptly healed There was no case of unhealed tuberculous sinus There was recurrence in only two cases which were discharged as cured. These cleared up on further treatment and have remained quiescent to date. In thirty of the cases the cure dated back over five years

[illegible] indicate [illegible] effect [illegible] these [illegible] id the author

does not believe there was any causal relation between the treatments and the subsequent development. Five patients changed their residence and transferred their treatment to other radiotherapists. Six patients failed to follow up the treatments after they had merely begun them Eleven patients are continuing the treatment, progressing favorably but are not yet ready for discharge as cured. The rest of the hundred have been discharged as apparently cured. The glands have been reduced to the merest kernels, and the general condition has been restored to one of well being. ARCHIE HARRISON, M.D

Groeschel L. B: Gastrocolic Fistula *Am J Roentgenol* 1921 n s. viii 516

Gastrocolic fistula is not a rare condition but the fact that it is seldom diagnosed is evident from the relatively small number of cases reported in the literature In the case reported by the author the fistula was diagnosed by means of the roentgen ray following the injection of an enema of barium and mucilage of acacia and demonstrated both by the fluoroscope and the plate on several occasions. A detailed history of the case is given, together with the laboratory and roentgen findings. Several roentgenograms are included.

ADOLPH HARTUNG M D

Bevan A. D: X Ray Burns. *Surg Clin N Am* 1921 i 935

X ray burns are painful. The pain is probably due to the obliteration of blood vessels which robs the nerves of their normal supply of blood as in senile gangrene The pain is often so severe that the use of opiates is necessary In severe burns not only the skin but the deeper tissues may be destroyed These very rarely result in cancer The superficial burn, so-called X ray dermatitis, is more apt to lead to epithelioma Many of the earlier X ray technicians lost their lives from this sort of cancer before the proper protective precautions were taken

In the treatment of severe X ray burns excision gives the best results. The whole damaged area is removed *en bloc* the dissection being begun well outside the burn and including tissue underneath it. The area is then covered with Thiersch skin grafts which are covered with one thickness of gauze very carefully applied Over this is placed a layer of several thicknesses of sterile gauze which in turn is covered with a sterile gauze roller about 5 in. in width Over this is placed a starch bandage which when dry fixes the dressing accurately in position. This dressing is left in place four or five days if there is no reaction, and is then removed carefully so as not to lift the grafts from their bed.

Too much time should not be spent treating these burns with salve and various dressings. As soon as [illegible] of skin [illegible]

the leg which teach that the X ray may do much harm and should be used only by experts.

MARCUS H HOBART M.D

Bérard: The Treatment of Cancer with Radium (Sur le traitement du cancer par le radium) *Lyon chirurg* 1921 xviii 503

From a study of the statistics given in the literature Bérard concludes

1 That in the treatment of cancer of the uterine cervix, radium either alone or combined with intensive X ray treatment has given undoubted clinical cures some of which have been controlled as long as eight years.

2 The recoveries resulting from operation still seem more numerous than those due to the use of radium alone, but less numerous than those obtained from the employment of radium combined with intense X rays.

The operative mortality varies from 5 to 10 per cent according to the gravity of the condition The risk of death is not negligible in treatment with radium ordinarily it is between 8 and 10 per cent.

In the second part of his article Bérard deals at length with the accidents which may result from radium treatment. The majority of such accidents and the total failures are due to errors of technique The [illegible] and infec the cervical cancers diffuse phlegmons arising from the introduction of radium tubes into ulcerated and infected tumors, and perforations of natural conduits and septa by the tubes.

In Bérard's opinion wide surgical excision is indicated if the tumor and invaded glands can be removed *en masse* and should be preceded by radium and intense X ray treatment to sterilize the cancerous elements already disseminated in the lymphatics though not clinically discernible The application of radium and the X rays after surgical operation seems of value only if there has been difficulty in liberating the tumor and there is a possibility that some of the neoplastic elements have been left behind. With the exception of cancers which are still local, the use of radium is [illegible] of the cervix the Wertheim and all other extended hysterectomies are inferior to the use of radium alone or combined with the X rays.

W A BRENNAN

LEGAL MEDICINE

Reasonableness of Requiring Morbidity Reports. *Smyke vs State* (*Miss*) 86 *So R.* p 870.

[illegible] a [illegible] of and regulations necessary to enable it to discharge its duties and powers to carry out the purposes and objects of its creation a regulation requiring every licensed physician practicing in the state to file a morbidity report on the first day of each month is not unreasonable. It is not only reasonable, but an important and valuable aid in the preservation of the public health.

The defendant testified that he had never received a copy of these regulations, that he had no knowledge of the existence of the rule requiring reports to be made on the first day of the month that, prior to the

administration of a named county health officer it had been the custom in that county to file these reports on or about the tenth day of each month, and that in so doing the physicians were acting under the directions of the county health officers.

As there was no presumption that the defendant had knowledge of a mere rule or regulation of the state board of health and as under the evidence the peremptory instruction requested by the defendant should have been granted, the court reversed a judgment of conviction for unlawfully and knowingly violating a rule or regulation of the state board of health and discharged the defendant

J A CASTAGNETTO

Efforts Should Be Used to Save Injured Arm or Leg. *Wrenn vs Connecticut Brass Co et al (Conn) 113 Atl R* p 638

The plaintiff on March 6 1915 sustained a fracture of the left forearm following which his arm remained in a twisted and unnatural position A competent surgeon was of the opinion that bone grafting would in some measure restore its function The operation was performed and by the latter part of April, 1916 the forearm had become straight, and the surgeons believed that a good functional result would follow Instead a suppurative process persisted and June 26 1916 it was necessary to operate further The second operative wound was healed by August, 1916

The arm has never been a useful member since the original injury and at no time has it been possible to use it for industrial purposes. The period of incapacity for which the injured employee was ment was discontinued as the wound had healed At the end of this period he was entitled to compensation for the complete and permanent loss of the use of the arm.

The court stated that all reasonable effort should be used to save an injured arm or limb and thus prevent the necessity for its amputation or the complete loss of usefulness of the member Until the time for such effort has passed, professional skill should be directed to effect a cure. When competent professional opinion on fair examination reaches the conclusion, or should reach the conclusion, that it is not reasonable to expect to cure or improve the injured arm, it can then be said for the first time that the loss of this member has occurred. This, however does not compensate the injured employee for the period between the date of the injury and the date of the determination of the complete loss of use. The loss of the arm through amputation occurs when the amputation takes place The complete and permanent loss of the use of the arm occurs when no reasonable prognosis for complete or partial cure and no improvement in the physical condition or appearance of the arm can be made. Until such time the specific compensation for the loss of the arm or for the complete and permanent loss of the use of the member cannot be made.

J A CASTAGNETTO

GYNECOLOGY

UTERUS

Daels, F : The Alquié-Alexander Operation (L opération d Alquié Alexander) *Bull. Acad roy de méd de Belg* 1921 5 s., 1 208

Although Daels has performed the Alquié-Alexander operation (extra peritoneal shortening of the round ligaments) in 150 cases with only two recurrences, he is not satisfied with the usual technique. Suture of the round ligament to the posterior surface of the aponeurosis of the external oblique is not simple and strong traction is necessary to obtain such fixation. Moreover it cannot be effected at an appreciable distance from the incision, the sutures both of the ligament on the aponeurosis and of the two ends of the aponeurotic incision fall side by side if they do not actually imbricate. Therefore as a very wide opening of the inguinal canal is necessary and there is irregular cicatrization with sometimes necrosis of a part of the ligament and the aponeurosis, Daels sought a method permitting the use of a smaller incision in the inguinal canal and fewer aponeurotic sutures while assuring solid fixation of the ligaments. After trying various methods he finally decided to fix the shortened ligaments on the ligaments themselves.

He makes a lateral incision 3 or 4 cm in length on each side at the level of the external ring of the inguinal canal, enlarges this ring with the finger or by section of the aponeurosis, and isolates the round ligament drawing it out for a length of 6 to 10 cm. By means of a forceps he hollows a tunnel under the aponeurosis of the recti muscles and through the f\
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over to the left and the extremity of the left round ligament over to the right. The ligaments cross in the tunnel and are fixed to each other by a few sutures in the inguinal canal. As frequently it is difficult to free the round ligaments fully he makes a vertical incision in the median line above the pubis and opens the sheath of the recti muscles, brings the ligaments here, ties them together and then buries the knot and covers it by an aponeurotic suture. The round ligaments are maintained in contact for the entire length of their aponeurotic tract and form adhesions.

Daels has performed this operation in fifty cases. Since he has abandoned the extended aponeurotic suture there have been no cases of necrosis and no postoperative ill effects. One patient died of pneumonia sixty days after the operation during the influenza epidemic. Twenty-six of the forty nine survivors have answered inquiries and twenty five state that the result is perfect In a few cases there is some peri- or para metritis Therefore the results were excellent in 80 per cent of the cases, satisfactory in 95 per cent and unsatisfactory in only 5 per cent

W A Brennan

Ranschoff J L. and Dreyfoos, M : Dangerous Intraperitoneal Hæmorrhage from a Uterine Fibroid *Surg Gynec & Obst* 1921 xxxiii 296

It is customary to regard uterine fibroids as benign tumors and to operate only when complications such as an increase in size pressure symptoms, or metrorrhagia develop However intra-abdominal hemorrhage may occur and, though very rare is very serious. In nearly all of the reported cases there have been distinct evidences of trauma either external or internal. Various diagnoses such as ovarian cyst with twisted pedicle extra uterine pregnancy perforation of gastric ulcer and in one case appendicitis, have been made. The hæmorrhages have usually been due to rupture of one or more dilated superficial veins just beneath the peritoneum

In every reported case, however precarious the patient s condition a hysterectomy was done but the authors believe that when the condition is desperate it would be a safer plan to transfix and ligate the bleeding vein on either side of the opening delaying a hysterectomy until some future time after the patient s recovery In a very serious case this certainly would be a life saving measure

C H. Davis

Kuehner H. G : Recurrent Adenomyoma of the Uterus. *Am J M Sc.* 1921 clxii 424.

The patient, a single woman aged 43 years, entered the hospital December 4, 1917, complaining of irregular profuse, and painful menstruation and a mildly irritating intermenstrual watery discharge. At times she did not menstruate for five or six months, but recently had been bleeding every three weeks. The menses were profuse and exhausting lasted from five to seven days, and were accompanied by severe pains in the back and general weakness. Her general appearance and nutrition were good. There was no weight loss, and the important functions, aside from menstruation were normal. The hæmoglobin was 70 (Sahli) and the erythrocytes numbered 4,300,000 Bimanual pelvic examination revealed a firm mass about the
gina and pro-
through the
The exposed

surface of the tumor mass was necrotic. The uterus was symmetrical and not enlarged.

The tumor was removed by vaginal myomectomy The specimen consisted of several irregularly torn fragments of tumor tissue removed from the uterus.

The larger fragments showed partial covering by intact endometrium but elsewhere there was superficial necrosis. Some of the smaller and thinner plaques resembled portions of a cyst wall. Throughout the larger masses numerous small, oval, honeycombed areas of pinhead size were observed, some of which contained a pearly mucoid material. Microscopic sections of the mass from the uterus showed a dense, waving, and interlacing fibro-

lar contour.

Although a few tortuous spaces were noted presenting for the most part empty lumina, some of the cavities contained a homogeneous, mucoid

the acinar structures were surrounded by a richly cellular stroma of concentric arrangement such as is seen in normal endometrium. Occasional mitotic figures were observed in the nuclei of these stroma cells. Still other alveolar elements were inserted directly between the muscle fasciculi of the tissue and displayed no accompanying stroma. The pathologic diagnosis was adenomyoma uteri.

Fourteen months later (February 1, 1919) the patient again sought the hospital with a return of all the clinical symptoms which preceded the first operation and in addition a definite metrorrhagia with its resultant secondary anemia. Pelvic examination disclosed a large firm mass the size of a fœtal head tightly wedged in the vaginal cavity. Vaginal myomectomy was repeated. Because of the firm impaction of the mass in the vagina it was necessary to remove it piecemeal. As in the case of its predecessor this tumor also hung into the vagina from within the uterus by means of a slender fibromuscular pedicle.

Several different sized pieces of tissue from the uterus, portions of which were discolored and superficially necrotic, were removed at the second operation. The surfaces of the tissue elsewhere were of a pale pink or red, moist glassy appearance and in places showed a normal mucous membrane. On section through the fragments islands of pearly gray tissue were encountered which at intervals showed microscopic cyst cavities of varying size containing a gelatinous gray or brownish material. The tissue was œdematous and could be easily crushed between the fingers. Microscopic sections of the tissue presented a dense, though œdematous, fibro-muscular structure throughout which were scattered islands of glandular tissue. The alveolar structures varied greatly in size and shape, some being tortuous, and at times contained a mucinous material. The acinar epithelium was of columnar type and occasionally surmounted a cone-like shaft of stroma which projected into the lumen in the manner seen in intra-canalicular fibro-adenoma of the breast. However, at no place was there any reduplication of the lining epithelium, no nuclear figures were observed, and there was no violation of the basement membrane nor papillary formation by parenchyma. For the most part the glands lay in a concentrically arranged, moderately cellular stroma which now presented rather marked myxomatous change. The pathologic diagnosis was adenomyoma of the uterus.

Three months after this operation (May 2, 1919) the uterus was found to be slightly enlarged. Eight months subsequent to the second operation (September 24, 1919) the patient returned, complaining of almost continuous bleeding. Pelvic examination showed the uterus to be considerably enlarged but quite regular in contour. Abdominal hysterectomy was advised and executed. The enlarged uterus was amputated above the cervix and removed with the attached adnexa of both sides. The uterus was opened through the posterior wall. It measured 13 by 9 by 5.5 cm. When reconstructed the serosal surface was smooth and regular and yielded no evidence of tumor within the organ. The myometrium was very thick, especially at the fundus where it varied from 2.7 to 3.3 cm. in thickness. Toward the cervix it measured 1.7 cm. The uterine wall was tough, with apparently an increased fibrous connective-tissue content, and the blood channels therein were tortuous and thick walled.

On opening the uterus three distinct tumor masses were found. The largest one occupied almost the whole of the posterior wall of the organ and had been cut through the second, a smaller one, about the size of an English walnut, was high in the fundus while the third, which formed a symmetrical

juncture with the myometrium was sharply demarcated but for the greater part merged almost imperceptibly with the muscular coat. On the cut surface this tumor measured 7.0 by 3.8 cm. Its surface presented a variously nodulated contour and was covered by an intact mucosa which dipped into the mass to meet the irregularities of conformation. Section through the tumor mass revealed a variegated appearance. At places the tissue was quite firm, gray, smooth, and glassy and not easily

fibrous core to which they were attached by a slender pedicle. These grouped cystic clusters gave this

portion of the tumor an appearance not unlike that of a hydatidiform mole.

The small cysts could be easily ruptured and the linings were smooth. This peculiar cyst formation gave the mucosal aspect of the tumor its peculiar appearance. At places the endometrium dipped into and over irregular cavitations in the tumor the walls of which were composed of a thick pale membrane When such membranous sacs were opened their inner lining in turn was observed to be studded by inward projecting lobulated cauliflower masses Nothing more than a thin watery fluid was found in such cavities.

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into the otherwise smooth empty cyst At the juncture of the tumor mass with the myometrium several rather large channel structures were observed and these, also presented the characteristic fungoid papillary projections into the otherwise smooth-lined cavities. It is noteworthy that these papillary ingrowths were somewhat more easily crushed than the remainder of the neoplastic tissue. The smaller nodule in the fundus was about the size and shape of an English walnut Its mucosal covering was complete and the component tissue was of soft consistency This mass also presented the characteristic cysts with a pale membrane comprising the cyst wall and the typical polypoid cauliflower projections into the cyst cavities, as noted in the larger mass. Several cysts in this instance were filled with a chocolate-colored fluid. The nodule was not sharply defined against the underlying uterine musculature although it did not invade the myometrium to any great depth. The oval sessile symmetrical elevation on the anterior wall was quite firm and was covered by an intact endometrium On section through the compact uterine wall a pearly opalescent area implanted directly into the surrounding opaque myometrium was encountered about 3 mm. beneath the mucosal surface No definite cysts could be determined in this area, and it was indistinctly differentiated from its environs.

Microscopic analysis of the tumor tissue of the uterine wall showed a compact fibro-muscular structure in large whorls. Gland structures of varied size and shape were quite regularly and abundantly scattered through the tissue. Some of the cysts were elongated or stellate. In the greater number the lumina were empty but occasionally there was contained in them a homogeneous material Not infrequently the irregular stellate acini presented definite bulgings into the lumina, due to the projection of a slender shaft of stroma tissue. These papillæ were almost invariably surmounted by a single layer of columnar epithelium and imparted a picture not dissimilar to that presented by an intracanalicular fibro-adenoma of the breast.

In the majority of instances the lining of the glands was of a tall columnar-cell type fairly uniformly arranged and occasionally showing definite cilia. The cell nuclei were, as a rule, quite large and vesicular Nevertheless, in some instances, and particularly where the glands were most tortuous the lining epithelium manifested a definite tendency toward proliferation or showed a papillary ingrowth into the lumen. At rare intervals mitotic figures were observed in the nuclei of the epithelial cells. In no instance did the mucosal cells violate their basement membrane or exhibit high invasive qualities. It is of interest to note that many gland structures were surrounded for varying widths by a more or less concentrically arranged stroma very like that seen about the normal endometrium while the remaining glands, devoid of supporting stroma were inserted directly between the muscle fasciculi. Nuclear figures were seen quite frequently in this stroma tissue. The sections displayed no evidence of an inflammatory reaction. The ' flowing in of the endometrium deep into the interstices between the muscular whorls was well demonstrated in the sections. E. L. Cornell, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Sampson J. A.: Perforating Hæmorrhagic (Chocolate) Cysts of the Ovary: Their Importance and Especially Their Relation to Pelvic Adenomata of the Endometrial Type (Adenomyoma of the Uterus, Rectovaginal Septum, Sigmoid, etc.) *Arch. Surg.* 1921, ii, 245

In an article abundantly and excellently illustrated the author reports a short series of perforating hæmorrhagic cysts of the ovary The lining of these cysts was low columnar epithelium, and in places, tubules and subepithelial tissue resembling endometrium which in some cases showed changes corresponding to and synchronous with the endometrium in menstruation. The contents of these cysts resembled old menstrual blood

Most of the cysts varied in size from 2 to 4 cm., though the largest was 9 cm. They were unilateral or bilateral singular or multiple and they perforated or ruptured their contents being discharged into pockets or folds of the peritoneum about the ovary or into the cul-de-sac. This bloody material caused irritation of the peritoneum and the formation of adhesions between the various organs in the pelvis.

Most of the cysts were found in women between the thirtieth year of age and the menopause. Few were found before and none after the climacteric. Generally the women were sterile or had been sterile for a number of years. Pain was the most frequent symptom caused by the adhesions. Some of the patients had dysmenorrhœa which increased with each period There were no special physical findings but nodules felt by rectal examination on the anterior rectal wall beneath the mucosa, where the retroverted uterus was adherent, were very suggestive. Even at operation one is sometimes mistaken as to the true nature of the condition as the tumor and adhesions suggest malignancy

In the adhesions were found epithelial structures like those in the cyst wall and about the site of perforation, i e glandular tubules and stroma resembling endometrium. The implantations were more frequent on the posterior wall of the uterus and the rectum, causing adhesions which obliterated the cul-de-sac. This glandular penetration was more extensive and deeper in the wall of the uterus than in other organs, the glands seeming to have a partial selective affinity for uterine musculature.

The cystic ovaries were found adherent to surrounding organs at the site of the perforation, which was observed to be on the lateral sides or the free border of the ovary. On separation of these adherent organs the perforation was reopened and more or less of the contents escaped. The extirpated ovary showed several rather characteristic features: the raw area about the site of the perforation, the contents resembling old menstrual blood, and the thickness of the walls which prevented collapse of the cyst after it was opened.

The author believes that these "implantations" or secondary adenomata" with endometrial types of tissue are due to transplants of epithelial cells discharged in the menstrual blood" or cyst contents at the time of rupture. The origin of the cyst in the ovary is unknown.

The treatment is essentially the establishment of the menopause and the removal of other organs or tissues which may be the cause of symptoms.

Twenty three case reports are given.

R E Cramer, M D

Eisenstaedter, D: Carcinomatous Dermoid Cysts of the Ovary (Carcinomatoese Dermoidcysten des Ovariums) *Monatschr f Geburtsh u. Gynaek.*, 1921 liv 360

Carcinomatous dermoids are relatively rare. In the entire literature only about sixty cases have been reported.

Of 209 ovarian tumors operated upon from 1910 to 1920 thirteen were dermoids and three were carcinomatous dermoids. The latter were removed from patients 41 38 and 54 years old, respectively all of whom died after the operation. The author reports the histories and autopsy records of these three cases and describes the histologic findings in two. In one case a carcinomatous cystoma had invaded a dermoid. In the other case a dermoid had become invaded by a carcinoma which developed near it. The histologic findings in the third case could not be reported because the specimen was lost. According to the statistics reviewed, malignant degeneration of dermoids shows a frequency of 18 75 per cent.

Von Lommyer (Z)

Schu[illegible]

Schumann states that ectopic gestation is so often the cause of acute abdomino-pelvic hemorrhage that other causes are often overlooked.

There are three types of ovarian hemorrhage: (1) interstitial, (2) follicular and (3) intrafollicular. The author discusses these types in detail and gives the history of a typical case. He believes that the primary cause of the hemorrhage is rupture of the follicular blood vessels due to a degenerative arteritis.

Trauma is usually the cause of tubal bleeding other than that due to extra uterine pregnancy. The history of a typical case as observed by the author is given in full.

Schumann's conclusions may be summarized as follows:

1 A diagnosis of ectopic pregnancy should not be made definitely unless the embryo is identified or evidences of decidual or placental formation are found on microscopic examination.

2 When a massive hemorrhage occurs from either ovary there is usually if not always, a degenerative arteritis which causes the rupture of the blood vessels.

Harvey B Matthews, M D

EXTERNAL GENITALIA

Villar, A.: Vesico-Vaginal Fistulas (Sobre fistulas vesico-vaginales) *Rev argent de obst y ginec* 1921 v 133

In one of the cases treated by the author in which the condition and situation of the fistula did not permit the use of the vaginal route be performed a [illegible] so far as possible the cervix the

which special attention is directed is the suturing of the vesical plane with catgut and of the vaginal plane with non-absorbable material. Tincture of iodine should never be used for disinfection as it is injurious to the vaginal tissues. In some cases of extensive fistula in which the anterior or posterior uterine wall must be used in closing the tract the author prefers infolding of the wall to scarification. A gauze drain is never left in the vagina unless there is severe hemorrhage. No postoperative vaginal lavage is used. A Petzer sound is placed in the bladder

failure was due to sexual intercourse.

W A Bardeen

MISCELLANEOUS

Bourne, A. W: Gynecological Causes of the Acute Abdomen. *Practitioner* 19 1 cvii, 174

The pelvic organs are often responsible for acute abdominal symptoms, thus making correct diagnosis and treatment difficult. Broadly speaking, all

acute symptoms may be classified in one of two groups (1) the alimentary type and (2) the genital type However as the abdomen and pelvis constitute one cavity, there cannot be a sharp distinction in signs and symptoms as at the outset a pelvic condition partakes of a genital character

There is also a broad difference in the physical signs. For instance an abdominal lesion with peritoneal irritation sets up a localized board-like rigidity, whereas an acute pelvic condition, especially in the deep recesses of the pelvic cavity produces tenderness on deep pressure with some muscular defence but no rigidity, such as is commonly seen in acute appendicitis

However, in nearly every case of acute abdominal illness due to pelvic disease there are characteristic physical signs to be noted by vaginal examination Pregnancy especially if far advanced, may be an obstacle to a correct diagnosis by vaginal examination, and may be regarded as a direct cause of an acute abdomen as in tubal gestation or the spontaneous rupture of a cæsarean section scar In

invariably indicated. Red degeneration of fibroids may produce acute and baffling symptoms. A previous innocuous fibroid suddenly becomes tender and painful and produces a rise in the temperature. Because of the pain operation is usually resorted to though it is questioned whether it is absolutely necessary Any large necrosed tumor is dangerous, however and should be removed The majority of these pelvic cases are curiosities and have little practical importance but the conditions described are commonly met with and frequently give rise to difficulties in diagnosis and treatment

C H. Davis M D

Peterson R.: The X Ray After the Inflation of the Pelvic Cavity with Carbon Dioxide as an Aid to Obstetrical and Gynecological Diagnosis. *Surg., Gynec & Obst.*, 1921 xxxiii 154.

This method has been used by the author in over 1

limited to the pelvic basin except in cases of rup-

the author states
d to fall into three

main groups (1) those due to infection such as *acute salpingitis* (2) those caused by internal hemorrhage, such as ruptured pyosalpinx and (3) accidents to tumors.

In cases of the first group by far the best results follow expectant treatment continued until the temperature and pain have subsided operation being performed later if necessary

In cases of the second group the urgency of operation is apparent in clear cases In subacute cases the diagnosis is difficult because the condition

In both

behind and to one side of the uterus. One point of difference is that in a case of recently ruptured ectopic pregnancy for instance the temperature is never raised being normal or even subnormal whereas in subacute salpingo-oophoritis it is invariably raised. One condition requires operation in the other delay is indicated

Cases of the third group of which the most common is torsion of the pedicle of an ovarian cyst *may be divided by examination* into two clinical types. In the first type there is a very tender abdominal tumor with rigidity and a rise of temperature and pulse In the second type there is no abdominal tumor but a slight swelling over the pelvic brim is noted on deep palpation. Such a tumor is generally a twisted dermoid cyst of the ovary

On account of the gangrene which may follow strangulating torsion of the pedicle laparotomy is

slowly and using the smallest amount necessary to obtain the information desired. Both the transuterine and transperitoneal routes of inflation were used although the latter was found to be preferable in by far the larger number of cases. In acute or subacute pelvic conditions the transuterine route is contraindicated.

To insure successful pelvic roentgenography the patient must be placed so as to allow the gas to rise upward displace the pelvic organs and force the intestinal coils out of the pelvis After many trials with different positions, the best results were secured with the moderate knee-chest position an inclined board with a notch cut out for the tubes being placed beneath the thighs The table was then tipped, as for the Trendelenburg position the patient being prevented from slipping by shoulder straps An 18-in. square of opaque fabric with a 6½-in. circular hole cut out of its center was laid on the buttocks to serve as a diaphragm. A plate-changing tunnel was then placed horizontally on the table double screen films were employed and a Coolidge portable unit operating in the ordinary lamp circuit furnished the roentgen ray An exposure of from fourteen to twenty seconds was usually required.

In conclusion, the following summary is offered

1 The uterus together with the tubes and ovaries can be clearly shown by pneumoperitoneal roentgenography

2 Because of their distention with gas the tubes are rather more clearly demonstrated by the roentgen ray when inflation has been brought about through the transuterine route than when the inflation has been effected transperitoneally

3 On account of the rapid absorption of carbon dioxide gas and the equally rapid subsidence of the *discomfort* produced by the inflation this gas should

be used in preference to oxygen which is very slowly absorbed.

4. Irregularities of the uterus and omental and bowel adhesions are clearly demonstrated by the pneumoperitoneal roentgen ray

5 In not a few instances the diseased and enlarged appendages are more clearly made out by pelvic roentgenography than by the most careful and searching bimanual examination, even when the latter is made under anesthesia.

6 With the improved position (knee-chest and Trendelenburg) smaller quantities of gas are necessary for inflation. Thus discomfort is reduced to the minimum.

7 If the technique of pelvic roentgenography is good, the retention of bowel coils in the pelvis will be proof of the presence of adhesions

8. The pneumoperitoneal roentgen ray is able to demonstrate pregnancy at a much earlier period than the examining finger

9 With good technique and good judgment in the selection of cases both transuterine and transperitoneal gas inflation are free from danger

10. Bimanual pelvic examination and pelvic pneumoperitoneal roentgenography are not antagonistic methods Each is valuable and its value is increased if it is used to check the other

ADOLPH HARTUNG M.D

Lacey F H.: The Results of Vaginal Operations for Prolapse by the Manchester School *J Obst & Gynec Brit Emp* 1921 xxvin 260

nine claiming that the operation had failed, re-ex

the author concludes that it is unnecessary to operate abdominally in uncomplicated prolapse or for perineal work. R E CHANNING, M.D

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Shaw, H N : Pregnancy Following Implantation of the Outer End of the Only Remaining Fallopian Tube into the Uterine Cornu After Resection of a Cornual Pregnancy *Bull Johns Hopkins Hosp* 1921 xxxii 305

Briefly the case reported is as follows

The patient aged 36 was admitted to the Johns Hopkins Hospital October 3 1919 complaining of irregular menstrual periods. Her last period had occurred in March For seven weeks afterward there had been no bleeding at all After this she had a period which lasted eight days and apparently had a regular period four weeks before her admission to the hospital A few days before her admission, bleeding had reappeared and since that time had persisted irregularly

The general picture suggested a left tubal pregnancy At operation by Cullen October 6, 1919 a tumor approximately 5 by 4 cm in size which was present in the left uterine horn was found to be a cornual or interstitial pregnancy

Cullen temporarily clamped the tube at its cornual attachment and drew it to one side He then resected the uterine horn leaving a raw area approximately 4 by 2 cm at its uterine attachment, drew the fallopian tube into the uterine cornu so that its inner end lay in the cavity of the uterus, and approximated the wound. He then drew the excess of bladder pentoneum up over the raw area to prevent adhesions.

After the operation was completed the fimbriated end of the fallopian tube which lay free was about 1 cm. long A cigarette drain was placed in the lower angle of the abdominal incision and the wound closed. The patient made a most satisfactory recovery and was discharged from the hospital October 23 1919

On December 28, 1920 the patient stated she was threatened with an abortion at two months. She was delivered prematurely at seven months because of placenta prævia. The child was born dead.

E. L. Cornell, M D

Polak, J O : Observations on Ectopic Pregnancies. *Am. J Obst Gynec* 1921 ii, 280.

Polak believes that it is possible to make the diagnosis of ectopic pregnancy before the critical stage if proper attention is given to the history symptoms, f cases present a teristic and has changes in the tube and the adjacent pentoneum.

He reviews 307 cases of ectopic gestation observed in the Long Island College Hospital Jewish Methodist Episcopal and Williamsburg Hospitals in Brooklyn Of this number three were full term abdominal pregnancies due to rupture of tubal gestations occurring early in the course of the pregnancy and five terminated in the secondary rupture of an intraligamentous pregnancy at the third fourth and fifth months, respectively In the remaining 299 cases rupture or abortion occurred before the twelfth week

These anomalous pregnancies occurred in three distinct groups of patients

1 In women with a previous history of a definite pelvic infection following marriage, intra uterine instrumentation abortion, or childbirth, or of an intra-abdominal operation followed by peritonitis with an intervening period of sterility which allowed sufficient time for the partial recuperation of the tubes One hundred and eighty six patients belonged to this group

2 In women presenting a history of dysmenorrhœa from the first occurrence of their menstrual function who on examination showed many developmental defects or hypoplasias, including funnel pelvis, infantile uterus, and narrow vagina and who had remained sterile after marriage for varying periods and finally became pregnant following some procedure for the cure of their sterility Such was the history of seven women who were subjects of repeated ectopic pregnancies. Ninety four patients belonged to this group

3 In women notably of Jewish, Irish or Italian birth who had had repeated intra uterine pregnancies ending in abortion or going to full term In

Tubal abortion or separation of the ovum from its decidual bed by bleeding into the decidua was n instances this varying amount into the broad a varying sized hematoma forty three times.

The location of the ectopic gestation sac was found to be as follows the interstitial portion of the tube, six cases, the isthmic portion of the tube, seventy nine cases, the ampulla and free portion, 203 cases, the stump of a previously amputated tube, three cases, and an angulation of the tube caused by a previous Gilliam or Baldy Webster operation, eight cases.

Clinically all ectopic pregnancies fall into one of two general classes (1) those which may be classed as in the non-critical stage with a distinctly

countable pulse of 100 or under, a systolic pressure of 100 or over and a hemoglobin content of 60 per cent or more (in this class there were 263 cases) and (3) those in the critical stage pulseless at the wrist, with a blood pressure below 90 a hemoglobin content under 50 and definite signs of internal hemorrhage and collapse (in this class there were thirty-six cases)

The mortality was as follows one death on the table from hemorrhage one death two hours after the operation from shock and hemorrhage and *five deaths from peritonitis*

The following facts are evident from the history in the great majority of cases of unruptured pregnancy

1 Ectopic pregnancy occurs most frequently when there is a congenital anomaly or a previous inflammation of the tube in the woman who gives a history of premenstrual dysmenorrhoea

2 There is either a period of amenorrhoea or an attempt at menstrual suppression but because of the unstable position of the ovum due to the imperfectly developed tubal decidua and erosion of the

and uterine bleeding.

3 The bleeding into the decidua plus the growing ovum distends the tube and causes the soreness and tenderness over the region of the distended

the uterine artery is more apparent on the side of the gestation sac. The uterus is displaced because the tubal tumor has fallen into the lateral, the posterior or the anterior cul-de-sac. The tumor is of rapid growth, exquisitely sensitive, and fluctuant

Primary rupture or abortion generally occurs before the eighth week of pregnancy and is seldom attended by serious symptoms There is usually an intervening period of several days, sometimes a week or more, before the rupture takes place. This was true in over 80 per cent of the tubal pregnancies under discussion Therefore there is little excuse for not heeding the danger signs and for awaiting the critical stage with the signs of severe internal hemorrhage

Among gynecologists there is no diversity of opinion regarding the method of treating unruptured ectopic pregnancy It is agreed that the tube should be removed by the abdominal route or emptied of its contents. In the critical stage the author waits until the reaction sets in Less than 1 per cent of the patients bleed to death (three in the 307 cases in this series as the result of the primary rupture) as usually the erosion goes through an arterial twig and not the main vessel

Almost all patients will improve following rest and the administration of morphine Blood transfusion is given preferably when the vessel has been tied, but in severe cases is indicated during the laparotomy E. L. Cornell, M D

DiPalma, S.: Interstitial Tubal Pregnancy; A Report of Two Cases. *Surg Gynec & Obst* 1921 xxxii 285

The author gives the history pathologic report, and photomicrographs of sections of two cases of interstitial ectopic gestation

Both cases were characterized by (1) a previous history of abortion (2) early rupture (3) extensive intraperitoneal hemorrhage and (4) normal adnexa. From the photographs showing normal isthmial portions of the tubes and the record of previous abortions, the cause of the ectopic gestation may be ascribed to a low grade inflammation of the uterus.

The author believes that the time of rupture and the amount of intraperitoneal hemorrhage depend on the site of the implantation of the fertilized ovum and the relation of its chorion frondosum to nearby blood vessels As the interstitial portion of the fallopian tube is about 1 5 cm. in length attachment of the ovum may take place at the uterine end, at the isthmial end, or between these two points, depending on the extent of the previous damage to the tubal lumen. If implantation occurs near the uterine end, the possibility of an early abortion in the uterine cavity is apparent, while if it occurs at the isthmial end by the trophoblastic action of the chorion frondosum in an area of least resistance, rupture will take place generally into the peritoneal cavity but occasionally into the folds of the broad ligament, depending on whether the attachment of the ovum was on the upper or lower aspect of the tubal lumen The hemorrhage resulting from the erosion of the arterioles which are usually present at this location will be extensive. If implantation takes place between the uterine and isthmial ends, where the thickness of the musculature of the fundus and the uterine wall is considerable it seems probable that, before rupturing the pregnant sac would attain a larger size and the rupture would be attended by very extensive hemorrhage from hypertrophied blood vessels, if these are involved C H Davis, M D

LABOR AND ITS COMPLICATIONS

Ebbinghaus, H.: A Bladder Stone as a Mechanical Hindrance to Birth (Blasenstein als mechanisches Geburtshinderniss) *Zentralbl f Gynaek* 1921 xlv 676

Wishing to interrupt a second pregnancy at its outset, the author's patient introduced into the uterus the hard rubber tube of a child s syringe The point of the tube broke off in the bladder The patient then suffered from bladder disturbances which were ascribed to the pregnancy During labor the child s head became fixed in the small pelvis The house physician discovered a very hard thickening behind the symphysis which he decided

was an osteoma. He sent the patient to the clinic where the object was thought to be a foreign body in the neck of the bladder At operation, performed immediately a bladder stone measuring 6 by 4 4 cm. and weighing 30 gm. was found Immediately following closure of the bladder a 6-lb child was born The bladder stone had formed around the broken-off hard rubber tube A vesicovaginal fistula which had resulted was operated on successfully a short time later ZIMMERMANN (Z)

Beck, A. C.: The Two-Flap Low Incision Cesarean Section; An Operation Applicable After an Efficient Test of Labor *Surg Gynec Obst* 1921 xxxiii, 290.

The technique described will eliminate the consideration of an elective cesarean section in borderline cases of dystocia.

As the use of an efficient test of labor is permitted most of these patients will be delivered through the natural passages. The few that fail may be delivered by the use of the technique described with

uses frequently in this respect

is erroneous, the author's technique does not sacrifice a non infected uterus and therefore preserves the functions of menstruation and reproduction

While his results in the infected cases are better than may be anticipated in the larger series, they indicate that the mortality will be less than 10 per cent. As this is the admitted mortality of craniotomy as well as hysterectomy following cesarean section in this class of cases, it would seem that the two-flap low incision cesarean section should be given the preference in all cases in which the child is alive.

Twenty nine cases are reported Four cases were elective cesarean sections. In twenty two cases one or more vaginal examinations were made. Eight patients had a temperature of 101 degrees or over All of them recovered

E L. CORNELL, M D

PUERPERIUM AND ITS COMPLICATIONS

Lang E.: The F — Connection Between Conjunctivitis \ I Mastitis (Zur hanges zwische Mastitis puerperarum) *Zentralbl f Gynäk* 9 xlv 750

After a careful study of 455 wet nurses the author comes to the conclusion that although there has been a marked increase in the number of cases of conjunctivitis in the new-born, there has been no increase in the cases of mastitis in wet nurses. An etiological connection between the two conditions therefore, cannot be proved. Infection of the nursling breast by the nursling through a pus discharge of the eyes is possible but gonorrhoeal mastitis has been found in only rare cases. KALB (Z)

Potvin: Hysterectomy in Acute Puerperal Infection (De l'hystérectomie dans l'infection puerpérale aigue) *Gynéc et obst* 1921 iv 207

The advisability of performing a hysterectomy in acute postpartum or postabortum infection is a subject which has been much discussed by gynecologists and obstetricians in recent years. The importance of this procedure is based on (1) the frequency of acute puerperal infection which is about 10 per cent (2) the difficulty in choosing any method of treatment and (3) the gravity of the condition, the mortality of which ranges from 21 to 51 per cent

Hysterectomy as a method of treating puerperal infection dates back only to 1886 when it was done for the first time by Schultz. The first report on its use in this condition was published by Wintrebert in 1895 D Anvers performed it in purulent metritis following puerperal infection. Jacobs Kelffer and Rouffart came to the conclusion that when the infection has extended beyond the uterine mucosa and invaded the muscle there is a chance of recovery if the operation is performed before the infection becomes generalized

of puerperal infection In Potvin's opinion, however its indications in this condition are clear and precise He believes it called for when it is necessary to stop the ascending progress of the infection at any cost. It is in reality the amputation of a gangrenous organ before its infecting products are thrown into the general circulation and should never be considered as an operation to be performed *in extremis* because under such circumstances it would only hasten death. W A BRENNAN

Cotte, G.: Hysterectomy In Acute Puerperal Infection (De l'hystérectomie dans l'infection puerpérale aigue) *Gynéc et obst.*, 1921 iv 227

methods do not bring about any appreciable improvement the vaginal hysterectomy recommended by Faure is the method of choice.

Hysterectomy is indicated especially in those prolonged acute types of septicæmia which so frequently result in death from secondary pyohæmia When there are signs of severe infection with a tendency to the development of pyohæmia, repeated chills, etc. and when examination of the lochia shows colonies of streptococci, it is best to operate without delay performing either a vaginal or an abdominal hysterectomy The latter should be chosen when the presence of a phlebitis of the utero-ovarian veins is recognized and when the infection has passed the pelvis and become diffused toward the abdominal peritoneum signs of peritoneal reaction being added. W A BRENNAN

MISCELLANEOUS

Holmes, R. W.: The Fads and Fancies of Obstetrics; a Comment on the Pseudo-Scientific Trend of Modern Obstetrics. *Am. J. Obst. & Gynec.* 1921, ii, 225.

The author summarizes his article as follows:

Conservative treatment has caused a decrease in maternal and fœtal mortality in private practice.

The maternal and fœtal death rates in hospitals have not shown an appreciable decline in one hundred years.

which will promote a prophylactic therapy will lower infant mortality more than the present attempts to do so by the routine operative termination of labor.

A properly conducted prenatal clinic combined with conservative conduct of labor is more certain to secure a decrease in the death rates than promiscuous intervention.

Under normal conditions, spontaneous labor aided by proper analgesia is safest for both the mother and the child. Inordinately applied operative interferences increase the hazards of birth.

The authorities who have fostered a peculiar method of routine interference in all cases and those who imitate them have retarded the advance in obstetrical care and are contributors to the high American mortality incident to childbirth.

It is lamentable that those who practice a routine intervention have a higher mortality than properly controlled midwives.

The proponents of operative cults have produced no evidence to show that their systems are more worthy and less risky or that they promise a higher conservation of life than carefully watched spontaneous labor.

There are no more reasons why all parturient women should be delivered by operation than that all people should be inflicted with routine enemata or catheterization.

A medical fad should be discountenanced; precept and example founded on injudicious enthusiasm lead to many unwise procedures.

The indications for obstetrical operations demand revision; certainly they should be more clearly drawn, and limited rather than extended.

A wise conservatism in obstetrics will be more productive of ideal results than injudiciously used skill.

Obstetrical teaching is so deficient in most colleges that there should be decided and early improvement; as long as obstetrical teaching is defective obstetrical results in practice will be poor.

An obstetrical curriculum should be devoted to practical instruction on the manikin, in the class room and in the clinic; obstetrical surgery should be a very small part of the coordinated whole. The proper place for the latter is in postgraduate courses.

E. L. Cornell, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Geraghty J T., Short, J T., and Schanz, R F : Multiple Renal Calculi Unilateral and Bilateral Some Observations. *J Am M Ass* 1921 lxxvii 901

In this paper the authors discuss some of the problems associated with the proper management of cases of multiple unilateral or bilateral renal calculi located in the pelvis or cortex of the kidney

Generally speaking a large unilateral stone in the kidney or the ureter which cannot be passed should be removed unless there is some definite contra indication to operative interference such as active pulmon
etc. If
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to which should be attacked first, the position of t
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throughout the kidney substance the kidney should be left undisturbed but if pain or infection are so severe as to demand interference a nephrectomy should be done Nephrotomy is unsatisfactory on account of the danger of very severe early or delayed hemorrhage because it is attended by destruction of at least one third of the secreting portion of the kidney in a clean case and of much more in the presence of infection, because of the probability of incomplete removal of multiple calculi and finally because of the not uncommon persistent urinary fistulæ due to the dislodgment of small fragments of the stone at the time of the operation In certain cases the authors advise the removal of these stones, especially when they may be reached by a pyelotomy or by several small nephrotomy incisions.

In some instances stones in the calyces may be released into the pelvis during pyelography and then may be readily removed by pyelotomy In another group of cases in which the kidney is literally filled with calculi it is often only a shell and if the condition is unilateral the kidney should be removed. If the renal lesion is bilateral, as is frequently the case its function is not often greatly improved by the removal of the stones If a pyonephrosis then supervenes a condition which usually results from impairment of drainage due to blocking of the ureter by a stone, ureterotomy may be necessary to remove such obstruction but if it should be necessary to open the kidney which is usually thin-walled, a rapid and complete removal of all the stones with drainage is frequently followed by marked improvement of function It is advisable in these cases to make a large incision in the mid portion of the kidney and to pack around a large tube rather than to use sutures.

The stag horn or branching calculus fills the pelvis and the calyces, and the roentgenogram resembles very closely a pyelogram. Such a stone usually produces few symptoms and is often discovered only by accident. As it can be removed only by complete nephrotomy such a procedure is usually attended by more renal impairment than would be produced by the stone over a period of years. These kidneys should rarely be operated on, as a rule nephrectomy is the operation of choice

In deciding on operation in any given case one is influenced by factors of immediate or remote importance. The development of an acute pyonephrosis, a complete ureteral block, or some other condition may require immediate interference. In other cases the possibility of preventing the development of future complications which may lead to renal destruction may justify the removal of the calculi In any case one should carefully consider whether the removal of the calculi will cause greater renal destruction than will result from the presence of the stones. One should further consider whether

feasible. A conservative attitude in the handling of many of these cases will be found to lead to better results as far as the patient's comfort and duration of life are concerned C. D. Hotzes, M D

Bryan R C.: Tuberculosis of the Kidney *South. M & S* 1921 lxxxiii, 355

various pelvic deformities or anomalies, and anomalies of the blood vessels.

In Young's opinion the etiology of tuberculosis of
following
) calculus
(2) infec
urtery and

nce of the
tubercle bacilli into the kidney occurs by way of the blood stream, through the lymphatics, or directly He calls attention to the lymphatic ex

verse As the lymph flow is always from the kidney

not toward it, the establishment of renal tuberculosis by this route is apparently a negligible factor

Direct infection may occur from Pott's disease or

usually the infection is secondary to a focus else-

the intertubular lymph spaces play an important part in spreading the infection between the pelvis and the cortex. By this means bacilli may be distributed along the cortex in areas remote from the primary lesion Cortical invasion of the second kidney may be possible

Bryan discusses the diagnosis in detail, including the cystoscopic findings and the use of pyelography when indicated

The treatment of renal tuberculosis is both medical and surgical Medical treatment includes dietetic and hygienic measures and vaccination

The article is profusely illustrated with drawings, photographs and pyelograms.

GILBERT J THOMAS, M.D

Bottaro, O L.: Double Abdominal Ureteral Fixation (Uréter o fijación abdominal doble) *Rev argent de ciruj y ginec* 92 170

A woman 58 years of age had a vesico-vaginal fistula which had destroyed all the fundus and the neck of the bladder and formed a cavity studded with calcareous deposits in which a fist could be inserted This lesion was complicated by vulvo-vaginitis and a double colpocele Because of the

and the superficial layers and muscles were incised until the peritoneum was reached The peritoneum was then turned back and the ureters, which were

prophylactic drain permitted closure of the wound by first intention The urine flowing through the

cutaneous openings of the ureters would be unsuitable because it would cause angulation

W A BALDWIN

BLADDER, URETHRA, AND PENIS

Mugniery E.: The End Results of the Maydl Operation for Exstrophy of the Bladder (Résultats éloignés de l'opération de Maydl pour ectrophie de la vessie) *Lyon chirurg* 1921 xviii 48

Nove Josserand has operated upon five cases of exstrophy of the bladder by the Maydl method The first operation was done in 1899 and the last in 1910 Mugniery reviews the results

There was one almost immediate death from peritonitis The patient operated upon most recently had some renal infection but this has disappeared The three other patients were operated upon twenty two seventeen and one half, and twelve years ago respectively All are in good health but two have slight nocturnal incontinence The only disadvantage of the Maydl method is that as compared with other methods it is associated with a greater risk of postoperative pyelonephritis

In 1904 the results in fifty-eight cases operated upon by the Maydl method were reviewed by Thobois. There were twelve postoperative deaths, seven of which were due to pyelonephritis, and six later deaths, four of which were due to pyelonephritis, one to cachexia, and one to some unknown cause Of the forty survivors five had some renal irritation, four had nocturnal incontinence, and one had incontinence during the day In the other cases urination occurred about every three or four hours.

A study of these results and those published since Thobois report leads the author to conclude that in the Maydl operation the immediate mortality ranges from 26 to 30 per cent The procedure is therefore a serious operation but it remains to be seen whether the Cunéo and Heitz Boyer operations, the only others in use are not more dangerous. In six cases in which the Heitz-Boyer method was used there were three deaths In two of the others the result is good if the bladder is emptied every two hours or oftener and in one case the result is poor

The total results of the Maydl operation show that sixty four patients out of ninety-eight have had good end-results The danger of pyelonephritis has been exaggerated The author believes that when this condition occurs it is due probably to ascending infection in the ureters which was present at the time of the operation In the Heitz Boyer operation the ends of the ureters can be sectioned

In spite of its risk of secondary renal infection the fact that the Maydl operation gives good end-results in 60 per cent of the cases, that it is simple in

technique, and that it can be performed in one stage makes it of value in the cases of young persons who cannot withstand long operations

W. A. BREWSTER

Fedoroff S. P. Total Extirpation of the Urinary Bladder in Cases of Vesical Tumor (Ueber die totale Blasenextirpation bei Tumoren der Harnblase). *Manuscript* Petrograd 1921

On the basis of 165 cases of tumors of the urinary bladder the author states that some pedunculated histologically non-malignant papillomata become malignant and some histologically malignant tumors show no signs of recurrence five years after resection. He maintains that papillomata of the urinary bladder should be considered clinically as malignant growths. Their removal by means of the snare and electrocautery is not certain to prevent recurrence. The electrocoagulation method introduced in 1910 has a much more definite effect and is indicated for all pedunculated and other growths which the cystoscope shows have not penetrated the bladder wall. For diffuse infiltrating bladder growths, large carcinomata and papillomata of the neck of the bladder resection is necessary. In far advanced cases however total extirpation of the bladder is the method of choice. The high mortality of this operation reported by Jaeger (61 per cent) Petroff (50 per cent) and Bystroff (47 per cent) has not been confirmed by the author. On the contrary

was that of a 39-year-old man who had been treated by different physicians for a tumor of the urinary bladder over a period of twenty years. The papillo- [illegible] removal [illegible] by resection. Fedoroff operation.

The second case was that of a 45 year-old woman with the history of a vesical tumor for thirteen years. After repeated removals of the growth she consented to total extirpation of the bladder. The ureters were implanted in the flexure of the colon. Six years after the operation she was still in excellent condition. The urine was passed per rectum eight to ten times daily.

The third case was that of a 59 year-old man who had had a papilloma removed several times. Histologic examination showed the growth to be a carcinoma. The author performed a total extirpation of the bladder and implanted the ureters into the flexure of the colon. Much infiltration of the growth in the surrounding tissues made the operation difficult. Death occurred a year and four months after the operation.

The fourth case was that of a 53 year-old man. After resection and thermocauterization a fistula remained. The diagnosis was carcinoma. After two months the ureters were implanted in the flexure of the colon. The cancer had grown through the bladder wall and formed metastases. The patient died six days later from pneumonia.

The fifth case was that of a 56-year-old man with carcinoma of the anterior and left side of the bladder wall. The ureters were implanted in the sigmoid flexure of the colon. One month later total extirpation of the bladder was done. Death occurred twenty days later from an ascending pyelonephritis.

The author maintains that total extirpation of the bladder gives good results even in the cases of old persons. Implantation of the ureters in the flexure of the colon gives a good functional result. Implantation of the ureters into the skin is to be abandoned because of the unfavorable and disagreeable after results. Lumbar ureterostomy or nephrostomy or the implantation of the ureters into the vagina or rectum may be done. Implantation into the vagina leads to a constant dribbling of urine. Implantation into the rectum is technically more difficult. The patient urinates eight to twelve times a day through the rectum and there is danger of an ascending pyelonephritis. The author greatly prefers implantation into the flexure of the colon. In implanting the ureter and suturing it into the flexure it is important to see that it is not under too great tension and is not kinked. In women the entire urethra must be removed to prevent metastasis. To obtain better access to the bladder the author makes a transverse incision severing the [illegible] remove the prostate and seminal vesicles.

Fedoroff warns against symphyseotomy or temporary resection of the pubic bone as such procedures help little and cause severe wound complications. In the case of males he drains through the anterior abdominal wall and is satisfied with that method. In the case of females drainage must be effected through the vagina.

The author believes that after a surgeon has once done the transperitoneal bladder resection he will never go back to the extraperitoneal method. The only contra-indication to the use of this route is a tumor growth involving the anterior abdominal wall and peritoneal infection.

Malignant tumors of the bladder remain localized for a long time and form metastases relatively late. The lymphatic channels related to the urinary bladder have not been definitely traced. Clinical [illegible] gland involvement. Recurrence took place from the original growth or the bed of the growth in the bladder or extended along the mucous membrane. Hence it is important to destroy any mucous membrane which may become affected. The earlier and the more radical the operation the less the danger of recurrence.

HESSE (Z)

Scholl, A. J., Jr : Squamous-Cell Carcinoma of the Urinary Bladder *Arch Surg* 1921 iii, 336

Trauma and infection not infrequently cause the mucosa of the urinary tract to undergo epidermization. These plaques of abnormal epithelium may persist for many years and have a tendency to undergo epidermization. These plaques of abnormal epithelium may persist for many years and have a tendency to un-

are of short duration and mild. Metastasis occurs, but not so frequently or so extensively as the extent and appearance of the local lesion would indicate Mitotic figures are fairly common in epidermoid tumors of the bladder but do not always indicate a high degree of malignancy as they are not so important a criterion of malignancy in epithelomata as in connective tissue tumors

Six cases of squamous-cell epithelioma were seen at the Mayo Clinic between January 1 1910 and January 1 1920 These cases are of interest not only because of their extreme malignancy but also because of the insidious onset of the condition and the absence of definite symptoms. The growths are readily recognized histologically a fact of distinct prognostic importance.

Three of the six patients examined were in an operable condition on an average of three months after the first appearance of symptoms. One of these had a recurrence four months after the operation and died eight months later one died six months after the operation and one, the only patient who did not die from the disease, is living and well nine years after the operation. The other three patients had inoperable tumors with symptoms referable to the carcinoma for an average of twelve months

Two of the six patients had undoubted cystitis for more than twenty-eight years, while in one the tumor was complicated by stone formation

The average age of the patients was 46 years, which is lower than the average age of those with carcinoma of the bladder The incidence of sex, four women and two men is also exceptional as usually the males outnumber the females three or four to one. A. C Johnson M D

Jacobs, L. C.: Manifestations of Lesions in the Posterior Urethra. *California State J M* 1921 xix, 370

Jacobs gives twelve case histories and shows some excellent photographs of wax models of the lesions as they appear on cystoscopic examination.

The two most important types of lesions with symptoms referable to the posterior urethra are chronic urethritis with prostatitis and those of the so-called sexual neuroses. The sexually neurotic type of patient is one who deserves the greatest consideration such persons suffer mental anguish and attach great importance to their symptoms. They should be given a cysto-urethroscopic examination because most of them show pathology in the posterior urethra which is particularly amenable to treatment The therapeutic results obtained in the majority of these cases by the use of the fulgurating current are very satisfactory

Louis Gross, M.D

GENITAL ORGANS

Stromінger L : Considerations Regarding the Pathogenesis and Treatment of Prostatic Hypertrophy (Quelques considérations sur la pathogénie et le traitement de l'hypertrophie prostatique) *J d'urol méd et chir* 1921 xii, 81

A consideration of many clinical and anatomical facts leads to two conclusions with reference to hypertrophy of the prostate first, that prostatic inflammation in some manner prevents the development of a true glandular hypertrophy and second, that prostatic hypertrophy is not a disease localized to the prostate.

The author believes there is an important re

servations in conjunction with the occurrence of

hypertrophy

Further proof of this relationship is given by the work of Castaigne and Lavenant who found that chronic nephritis becomes ameliorated following prostatectomy The author furthers the view of Albarran that urinary retention is due to a genito-

Hunt, V C.: Surgery of the Prostate. *Minnesota Med* 1921 iv 541

Not more than one-half of the persons with diseases of the prostate require surgical treatment. The non-surgical group is composed of those with

hypertrophy forty-eight specimens showed prostatitis as the primary condition with a few small adenomata and fifty-six evidenced marked prostatitis with associated primary adenomatous hypertrophy Chronic prostatitis may produce all the symptoms of adenomatous hypertrophy such as frequency difficulty and incomplete emptying of the bladder

with residual urine and even at times acute retention. This type of gland, distinguished by fibrous tissue formation is evidence of the prominent rôle played by infection in the etiology of late prostatic disease.

Prostatic abscess is of relatively slight surgical importance because as a rule it complicates the acute prostatitis of venereal origin and ruptures spontaneously into the urethra

Carcinoma of the prostate is found in 15 per cent of persons with symptoms of prostatic obstruction In the great majority of cases surgery is contraindicated because of involvement of adjacent viscera or distant metastasis. *In an analysis of 362 cases of carcinoma of the prostate observed in the* Mayo Clinic Bumpus found remote metastasis in 21.8 per cent, and in a later series metastasis was noted in 30 3 per cent of 135 cases. The pelvis, spine, and femur were the bones most frequently involved Surgery in this type of case is not beneficial except insofar as palliative measures for the relief of obstruction are indicated

Benign adenomatous hypertrophy is the most common surgical lesion of the prostate. It occurs most frequently late in life, 83 per cent of the cases occurring in the sixth and seventh decades.

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prostate may be a huge intra urethral and intra vesical growth.

A large prostate unproductive of symptoms does not require surgical treatment, but when irrespective of its size, it is responsible for frequency or difficulty in micturition, pain, hematuria, and residual sence of gene icting prostate n the upper ur The [illegible] most important s who must be tually uremic. ise of infection the bladder is often a septic pocket because of infected residual urine, and the blood-urea nitrogen is markedly increased The preliminary treatment is directed toward the relief of these conditions and the most important step is proper drainage of the bladder The author cautions against rapid drainage of the residual urine and emphasizes the desirability of gradual decompression of the bladder by the Van Zwalenburg method The more severe cases demand suprapubic drainage approximately 25 per cent of the patients have less than 2 oz. of residual urine and no renal insufficiency and can be subjected to prostatectomy without preliminary treatment. About 50 per cent must be prepared for prostatectomy by the use of a permanent urethral catheter

Van Zwalenburg's method of gradually decompressing the bladder has increased the percentage of cases in which a one-stage prostatectomy can be performed with safety At the Mayo Clinic the one stage suprapubic operation following preliminary gradual decompression of the bladder is preferred

The chief advantages of the one stage operation are that the operative field is in full view hemorrhage is more easily controlled associated lesions, such as stones and diverticula can be dealt with infection is less frequently a complication and convalescence is shorter

Spinal anæsthesia induced by the method of Labat, or combined transsacral and abdominal in *filtration with novocaine, has been used in all prostatic operations for the past six months.* The range of operability is thereby extended and the time element in the operation decreased

Technical points in the one stage operation emphasized are (1) careful suturing of the bladder neck which is the source of most of the bleeding (2) control of the bleeding from the interior of the prostatic capsule, and (3) accurate closure of the bladder The Pilcher bag is successfully used in the Mayo Clinic All suprapubic tubes are removed on the day following operation a urethral catheter being inserted The suprapubic wound usually heals by first intention and there is no urinary drainage after the removal of the bag

A reduction in the mortality rate during the past few years has been due to (1) the recognition of the fact that these patients are potentially uræmic and require preliminary treatment before operation, (2) improved technique in the operation and (3) the elimination of ether as an anæsthetic.

Ninety four and five tenths per cent of 614 patients report that they are cured or markedly improved

V G Bourne M.D

Bugbee, H. G : Prostatectomy in Bad Surgical Risks. *J Am M Ass* 1921 lxxvii 905

The author outlines his pre-operative treatment of cases of grave prostatic obstruction associated with marked cardio-renal disease, his method of operating and the postoperative management. He states that old age as a contra indication to operation has probably been over-estimated and that even in the presence of advanced cardiac and renal complications prostatectomy may be carried out with success if performed in several stages. Careful attention should be given to the patient's general condition. If hemorrhage is avoided at the time of the enucleation much of the shock and renal insufficiency will be prevented

The present step-by step technique of prostatectomy has removed many of the contra indications to this operation While only a few years ago speed of operation was regarded as the most important factor in the successful treatment of this condition we know now that this is not logical and that the time necessary for its relief will be more or less in proportion to the time involved in the culmination of the pathologic process in the final condition

In the pre-operative management of this type of case the first consideration is the prevention of absorption from the bladder the relief of the kidneys, and the promotion of elimination in other systems Drainage of the bladder will relieve the kidneys and prevent absorption but if this is done rapidly either by complete catheterization at once or by cystotomy uremia may supervene When the patient is carrying over 6 oz of urine the bladder should never be emptied at once unless it is accustomed to being catheterized a greatly over-distended bladder should be emptied gradually over a period of two weeks. A catheter may be fastened in the urethra

inserting the Pezzer catheter stretched over an introducer into a very small incision in the bladder A suture on either side of the catheter in the bladder wall insures tight closure, and a clamp on the tube will allow the urine to escape as desired During this time a great deal can be accomplished by forcing fluids by mouth and rectum and by promoting free elimination by the intestinal tract The patient should be kept out of bed as much as possible.

As a high blood pressure is preferable to a low one—fluctuations of pressure being indications of

tity of food and has a moist clean tongue, the prostate may be enucleated Except when the patient is fat the enucleation may be readily executed through the suprapubic cystotomy sinus under gas-oxygen anesthesia with one finger when the prostate is lifted up from below by an assistant a

patient is gotten up in a chair as soon as he feels equal to it, which is often the following day The *Pezzer catheter is left in for* about *eight days*, at

about three weeks

The author reports nine cases of marked prostatic obstruction complicated by marked renal and circulatory disease in patients whose ages ranged from 68 to 90 years. These cases were successfully managed by the methods discussed

C D Holmes, M D

Rubritius, H.: The Two-Stage Prostatectomy (Zur zweizeitigen Prostatektomie) *Zeitschr f urol Chir* 1921 viii, 109.

After discussing the history of the two-stage prostatectomy and emphasizing the services of Kuemmell in introducing it, the author states that this method has been adopted because the results of the single stage operation have not been satisfactory and because by this technique we are able to give relief in a much larger number of cases, including those in which the second part of the operation is not performed For example, the poor kidney function, insufficiency and infection can be relieved much better by cystostomy than by the use of a permanent catheter

Of forty two patients operated upon eleven were treated by the two-stage procedure With one exception these patients were in the seventh and eighth decades of life. Half of them had severe retention, hematuria, and poor function Function was tested by the Voltevula water test and indigo-carmin Elimination and concentration improved after the first part of the operation. The intervals between the first and second stages ranged from thirteen days to six months. Two carcinomata were cured.

Among the patients operated upon by the two-stage method there were two deaths. A 72 year-old patient who had recovered very well after the first operation died a day after the prostatectomy

up Therefore, the formation of a fistula with a trocar should be abandoned

The technique recommended is that ordinarily used In the first procedure a tube should be introduced into the fistula and after six to eight days a Petzer catheter should be placed in the bladd

for the operation.

Rothschild (Z)

1921 xlv, 35

MacGowan says that the bipolar current is practically a bloodless and safe procedure so long as the end of the electrode is not thrust through the tissues

that lie outside of the bladder walls toward the rectum or the peritoneal cavity His method is as follows

The tissues are desiccated and as the desiccation increases the tissues are snipped away with scissors until the margin of destruction is approached as evidenced by the ability of the vessels to seep a little bloody serum. When the process extends into the walls of the [illegible] be involved in desiccated it is of the hardened infiltrated portions of the bladder wall marking the site of the tumor have become flexible to the finger and all the blood vessels of supply have been destroyed by the current. If the line of direction of the growth is toward the rectum the gloved finger of an assistant is kept in this cavity to give timely warning of too close approach to the gut evidenced by a considerable degree of heat which precedes the advancing point of the electrode.

If the growth has sprung from the prostate, the electrode is thrust into the capsule of the prostate on either side and these tissues are also coagulated after all of the intravesical portion has been removed It is not necessary according to the author to proceed to the extent of absolute destruction as in the treatment of cancer of the bladder or a cancerous growth springing from the prostate unless it is very evident to the sense of touch that the growth is malignant. In the latter case it should be loosened up after the plane of cleavage is found and gradually enucleated, and as the tissues are cooked the capsule should be thoroughly treated with the spark with all the outlying structures that seem to be involved in the malignant growth.

In cases of malignancy further certainty of cure is acquired by introducing within the capsule of the prostate a suitable quantity of radium and leaving it there a proper length of time after the removal of the prostatic tumors.

The author reports five cases and states that a successful result could probably have been obtained by any other method in only one of them.

LOUIS GROSS, M.D

Walker J W T : Open Prostatectomy *Brit M J., 1921 ii, 311*

In reviewing the results of the operation of prostatectomy as generally practiced the author was struck by the fact that the three main complications and sequelæ, hæmorrhage, infection and postoperative obstruction are due chiefly to the completion of the operation without proper exposure. Walker advocates and describes an open operation which aims at placing prostatectomy on a higher plane in the scale of surgical procedures.

Although death ascribed to hæmorrhage following prostatectomy is rare, it is undoubtedly true that hæmorrhage plays a large part and is often the deciding factor in deaths attributed to shock, collapse renal failure, etc. Control of hæmorrhage is much more certain when proper exposure is obtained than in the blind operation

Infection generally occurs after prostatectomy but its severity can be greatly reduced and its more serious sequelæ rendered less frequent by the removal at operation of tags and pieces of tissue which if left would slough.

Obstruction occurs almost entirely at the internal meatus where the bladder joins the cavity remaining after the removal of the prostate This sequela may be effectually prevented by excising the folds and strips of mucous membrane and a portion of the semilunar fold formed by the trigone at the posterior lip of the orifice

The prostate is enucleated in the usual manner with the gloved forefinger of the right hand and generally without the assistance of a finger in the rectum. The patient should be in the horizontal position. A suture is then inserted in the bladder wound at each side, the patient is placed in the Trendelenburg position, and the author's retractor is introduced This instrument allows excellent exposure. By clipping away loose tissue, the prostatic cavity is cleared of débris. A wedge-shaped section caught up by pressure forceps is removed from the posterior crescentic ledge, and sutures are introduced and tied external to the forceps. An oval opening is thus left which forms part of the bladder

It is unnecessary either to preserve the strip of urethral mucosa which may remain posteriorly or to attempt to suture the urethral mucosa to the mucosa of the bladder Such a tube deprived of its blood supply is a menace Hæmorrhage is best controlled by suture under the lip of the vesico-prostatic opening and by packing The bladder blades of the retractor are now replaced by abdominal blades and after the frame has been turned toward the feet, the abdominal wound is repaired A drain is left in the prevesical space.

The duration of the open operation is slightly longer than that of the blind operation but time spent in the latter on irrigation to control hæmor

[illegible]

Lombard P and Béguet M : Suppurative Orchitis Due to the Micrococcus Melitensis (Orchite suppurée due au micrococcus melitensis) *Presse méd* Par 1921 xxix, 753

Genital complications are present in about 5 or 6 per cent of cases of Malta fever Sometimes they occur during convalescence, becoming suddenly manifested by a sharp pain in one side of the scrotum The rapid swelling following is due to tumefaction of the testicle or of the testicle and epididymis. The pain diminishes at the end of six to eight days. In a few weeks, often less, the swelling disappears and the orchitis is ended Recurrence, however, is possible In exceptional cases there is

suppuration. The micrococcus melitensis is not necessarily pyogenous and a testicular abscess due to it is very rare. The authors know of only four cases, one of their own and three reported in the literature. Their own case was that of a man 56 years of age who gave a history of malaria and dysentery and a recent attack of fever followed by swelling of the right testicle to the size of an orange Castration was done The testicular pus showed the micrococcus melitensis in pure culture.

Orchitis associated with Malta fever arises from a blood infection It involves both the glandular structures and the tunica vaginalis In the gland the suppuration has multiple foci the tunica vaginalis in its vicinity reacts early and becomes filled with a liquid which at first is serous and then purulent, the change being due to rupture of the intra glandular collections into the serous liquid. Clinically the process may appear as an acute, subacute, or chronic vaginalitis The case reported in this article belonged to the subacute variety

In the authors opinion the seriousness of suppurative orchitis following Malta fever is dependent upon the number of the purulent foci. The gland may be honeycombed with abscesses causing destruction of the greater part or all of it. In such cases there can be no thought of preserving the gland and castration is indicated Possibly if the true nature of the condition could be diagnosed very early the gland might be saved The authors suggest also that serotherapy or vaccinotherapy might prove of value W A Bardwax.

SURGERY OF THE EYE AND EAR

EYE

Van Duyse, G M : Colobomatous Microphthalmos with a Retropalpebral Orbital Cyst (Microphthalmos colobomateux avec kyste orbitaire rétropalpébral) *Arch méd belges*, 1921 lxxv 593

The author's study was made on a dolichocephalic hydrocephalic fœtus with chellognathopalatoschisis sexdigitism and pes equinus. The two ocular bulbs presented the same anomalies but they were some what more accentuated on the left side. On the right there was acorea, and an epithelial lamina of the iris extended backward. On the left there was entropsion due to duplication There were four nuclear arcs in one cataractous lens but on the con gener lens these had been rendered indistinct by degeneration of the fibers causing liquefaction of the cortical layers.

The retina, which was well developed in the right

between the intrabulbar retina and the intracystic retina the continuity of which was perfectly pre served in the right eye. The bulbar cavity led into the cystic cavity by a wide neck on the right side and by a sinuous neck on the left. This was because an intercalary tissue has caused a deviation of the retina which passed into the cyst while separating it from its distal intrabulbar segment as it had separated the pigmented lamina in partially trans forming it into epithelial cysts.

In addition to this peculiarity which modified the anatomical topography of the left eye as compared with the right, the pigmented lamina of the eye

remaining pushed back on the nasal side One of the segments formed a pocket behind the upper eye lid. The cystic covering which is a continuation of the pigmented epithelium—cylindrical retina and inverted rudimentary retina—corresponded to the external lamina of the duplication of von Hippel, to the folded lamina of the optic part, metamor phosed, simplified and remaining in the primitive state.

The intrabulbar retina was herniated becoming

caused a "retinocele." The eventual presence of a subretinal fluid favored the cystic development caused by the retinal hernia

In the interior of the cyst two central segments of retina were found which were separated by an axis of the vitreous body and hyaloid vessels with their internal limits toward these and their external limit toward the cystic cavity

The inverted retinal lamina covered the internal wall of the cystic diverticula sometimes in the form of a poorly differentiated retina with a stratum of single cells turned toward the cystic cavity and an inner glial stratum adjacent to a hyalinized meso derm and sometimes in the form of strata of cylin drical elements In the neighboring cystic parts of the eye there were layers of pigmented epithelium This segment of retinal lining passed into glial hyperplasia, to localized gliosis which may be compared to the atypical proliferation of Fried lander A marked peculiarity was the formation of buds and dermo-epithelial villosities in the region of the pigmented epithelium of the cyst

Von Hippel has spoken of a cystic formation containing four laminæ the inverted peripheral laminæ of the retina and the internal laminæ with strata arranged normally According to Natanson no case is known in which the inner lining of the cyst was found so constituted. Van Duyse however in 1900 reported this finding in a brother of the subject whose case is reported in this article. The type of malformation described by the author is summarized briefly as follows

The retina of the secondary ocular vesicle not

optic nerve. The non-inverted part, the external lamina of the retinal duplication became united to the surrounding mesoderm and continuous with the pigmented epithelium which remained forcibly separated from the optic nerve. The folds of the pigmented epithelial lamina, like those of the internal lamina of the secondary optic vesicle may have become detached, isolated, and transformed into cysts or the cavity of the orbital cyst may always have communicated with the subretinal space of the eye.

This article, a complete study of colobomatous microphthalmos is supplemented by a number of histologic plates. W A. Brodman

Ziegler S. L.: The Ocular Menace of Wood Alcohol Poisoning. *Brit. J Ophth* 1921 v 411

Ziegler concludes after a critical study of the phenomena occurring in cases of wood alcohol poisoning that the primary and fundamental lesion is a profound injury of the pituitary body The changing but steadily contracting fields, the fugitive scotomata, the visual loss and recovery the scler

osed or atrophic nerve heads, the fixed and dilated pupils, the temporary paresis of the extra-ocular muscles, the ptosis, the ataxic gait and the mental hebetude are all characteristic of such involvement.

Methyl alcohol is the most deadly poison used in daily commerce one teaspoonful has caused blindness and one ounce has caused death It may enter the body through the mouth the nose, or the skin. It is a protoplasmic poison possessing a selective affinity for the delicate nerve tissues of the eye. Its biochemistry is modified by oxidation, first to formaldehyde and then to formic acid, both of which are corrosive poisons, formic acid is the end product excreted by the kidneys

Sudden blindness with vomiting and abdominal pain, especially if associated with diplopia or ptosis, should always arouse suspicion of methylic poisoning papillitis, sector-like atrophy and sudden sclerosis of the nerve head are equally typical fundus lesions contracted fields and central or paracentral scotomata are usually present. Van Slyke's test will reveal acidosis in the early stages and alkalosis later

The treatment should include early neutralization by alkalies to lessen the destruction of nervous tissue and elimination by lavage, emetics, diaphoretics, purgatives, and rapid oxidation Lavage should be repeated because much of the wood alcohol in the system is returned to the stomach

To revascularize the disc and restore the lost function of the nerve no measure can equal the stimulating effects of negative galvanism this should be administered with great care, with a high voltage and low amperage Sixty volts should be passed through the main shunt controller with the amperage reduced to 1 mm. by a secondary carbon controller. The current should be passed for ten minutes, and then reduced to ½ mm and passed for a second period of ten minutes. These séances should be continued on alternate days This is the most efficient therapeutic measure known for the milder cases of toxic injury in which there has not been complete destruction of the nerve fibers If the nerve fibers have been completely destroyed, galvanism will have no effect whatever

Six cases are reported with the results of treatment

C Coman Yancey M D

Sirlin G: Corneal Ulcer and Hypopyon Cured by Milk Injections (Ulcera de la córnea e hipopión curada con las inyecciones de leche) *Semana méd* 1921 xxviii, 434

A diagnosis of corneal ulcer complicated by hypopyon and iritis was made in the case of a [illegible] photophobia had diminished and the vision was more acute One injection a day was given for three days The hypopyon has now been resorbed the iris has recovered its normal appearance, and the patient has no further symptoms W A Brannan

Rose, S G: Nutritional Keratomalacia in Infants, with a Report of Four Cases. *Am J Dis Child* 1921 xxii 232

Rose defines keratomalacia as xerophthalmia in which the most characteristic changes take place in the cornea, and states that the condition is quite rare, the four cases reported being the only ones in 28,000 admissions to the children's department of the Johns Hopkins Hospital These cases are reported in detail with two necropsy reports. In one case of death no postmortem examination was made. One patient lived

Rose reviews the reports of various men who did not at first understand the disease fully, considering it a complication of an acute infection of a neuroparalytic keratitis, a manifestation of congenital syphilis, or an entity with a specific bacteriological cause. More recently the relationship between malnutrition and the disease was [illegible] elements

Mori in 1904 noticed 116 cases of a very similar condition in which cod liver oil acted as a specific and concluded that the disease was due to a lack of fat in the diet In Germany a very similar condition known as "Mehlnaehrschaden was found in infants whose diets consisted almost exclusively of carbohydrates Much work has been done in the past four or five years, especially by McCollem and Davis, experimenting on rats, which shows the close relationship between the lack of fat-soluble vitamine A in the diet and xerophthalmia. The author cites also the work of many other investigators. The pathology he has given in detail. He comes to the conclusion that the condition is a deficiency disease rather than an inflammatory process as was heretofore generally believed.

Thomas D Allen M.D

Chance, B.: Radium Plugs for the Dissolution of Orbital Gliomatous Masses After Excision of the Globe. *Am J Ophth* 192 iv 641

A profoundly cachectic child under 3 years of age [illegible] and A d monus later the enormously distended right globe which had ruptured, protruded between the lids, and projecting through the anterior segment, was a granular pultaceous mass which bled at the slightest touch. Excision was consented to by the parents The globe was freely movable, the tumor mass not having perforated the sclera, and the orbit was quite free from nodules.

In the meantime the disease had progressed in the left eye, b[illegible] and of [illegible] sing [illegible] orbit

globe and the eye was excised The operation was difficult because of the mass which filled the apex of the orbit. The child immediately improved in general health.

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corrosive nickel steel cases 20 to 25 mm long and 2 mm thick, each containing 10 mg. of radium sulphate were inserted into this mass and five smaller needles and one large needle into the presumably unaffected tissue in the right orbit They were left in place for twenty hours

This treatment was followed by shrinking of the tumors and apparent cure.

The difficulties attending the use of radium in metal containers was greatly overcome by the composition of the metal employed in these needles which besides being non-corrosive filtered out the harder and more deeply penetrating rays.

C CORBIN YANCEY M D

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Kelly R. A.: The Tonsils as Foci of Infection. *J Med Research*, 1921 xlii, 315

Foci of infection may be divided into two groups, active and inactive. Inactive foci are those which, though containing living and virulent organisms, do not produce general disease, being well walled off but remain as potential sites of infection. The active types, on the other hand either by reason of the virulence or the numbers of their organisms are constantly pouring into the circulation not only the organisms themselves but also the products of their growth

The study reported was undertaken to determine definitely whether tonsillar tissue does or does not contain actual organisms The material consisted of both tonsils removed from a series of routine cases selected from a large clinic as those requiring tonsillectomy by reason of the fact that they showed disease clinically The patients included both adults and children, the latter predominating, and the tonsils showed grossly and histologically the same changes as those noted in a series removed from soldiers.

Immediately after their removal the tonsils were sent to the laboratory in sterile gauze, the epithelial surfaces of both were thoroughly seared with a red hot copper searing blade, and material from the inside was expressed onto the seared surface by pressure. This material included that present in the crypts as well as the cellular elements from the tonsillar substance. Its character varied from the soft pulpy cells of the tonsillar tissue to a purulent material from confined abscesses, including the inspissated cheesy material of constricted crypts The author states that it is practically impossible to separate the material deep in the crypts from the tonsillar tissue, and it does not seem that this separation is necessary to obtain proof that the tonsils harbor micro-organisms

It is true that the epithelial lining of the crypts may act as an impassable barrier to the invasion tonsillar tissue. This, it seems, is a weak point in the evidence that tonsillar tissue is the actual seat of micro-organisms but the construction of the tonsils will not permit a clear-cut differentiation between the two situations.

The results of the experiments are summarized as follows

1 The tonsils have been shown to be the avenues of invasion for various micro organisms.

2 The tonsils are to be considered as foci of infection, active or inactive from which the absorption of toxins into the general system takes place.

3 The tonsils are considered foci of infection, active in character from which micro-organisms are poured into the general circulation, producing bodily disease.

6 The organisms were those usually found in oral flora

7 Streptococci predominate but are closely followed by staphylococci, these two organisms constituting 65 per cent of the total number

GEORGE E BEILBY M.D

Moore, L.: The Surgical Removal of the Tonsils. *Brit M J* 1921 ii, 437

Moore discusses the local methods of arresting

of the faucial pillars.

are contra-indicated operation should not be performed or should be postponed.

2 The operation should be performed only in a hospital or nursing home

3 Careful attention must be given to the preparation of the patient for the operation.

4. An expert anesthetist is necessary

5 The surgical procedure used should be one in which easy control of bleeding may be secured at the time of the operation

6 There must be adequate postoperative supervision and care. O M ROTT M D

Duthaillet de Lamothe, G: The Surgery of the Palatine Tonsil (Contribution à l'étude de la chirurgie de l'amygdale palatine) *J de chir* 92 xviii, 337

The author compares the various methods of removing the palatine tonsil and states that most of them are incomplete as neither the fibrous capsule nor the infected crypts are removed entirely His own method, a modification of Vacher's consists in more complete liberation of the gland by dissection of the part adherent to the palatine arch and liberation of the superior pole not only in front but

also above and behind. Ethyl chloride is the anæsthetic employed The liberation of the superior tonsillar pole is effected as follows

The left tonsil having been pulled into the mouth with the forceps a buttonhole incision is cut in its middle third with a curved scissors sharpened on the outer as well as on the inner edges. The scissors is inserted under the palatine arch and cuts the *triangular fold, His fold* etc. These *thin membranes* yield without resistance and there is little hæmorrhage. The tonsillar fossa being thus widely opened the forceps holding the tonsil is basculated to draw the superior pole from the supratonsillar fossa in which it is almost always deeply embedded At the same time the closed curved scissors is utilized as a dissector and to push the superior pole down it is passed from the outside inward and sections the fibers which bind the tonsil to the walls of the fossa When the superior pole is free the tonsil is removed by snaring its pedicle.

For the right tonsil the posterior blade of the scissors is introduced under the triangular fold and the latter is severed by one cut from above downward. Strong traction being made on the tonsil, the adhesions fixing the superior pole are sectioned by a series of small cuts. The superior pole is disengaged by applying the concavity of the scissors at its upper part. W A Brennan

O Malley J F : Conditions Predisposing to Hæmorrhage in Tonsil Operations. *Brit M J* 1921 ii, 433.

The contra indications to operation and the prophylactic measures are summarized as follows

CONTRA INDICATIONS TO OPERATION

1 Tonsilar (a) acute inflammation and quinsy (b) ulceration (erosion of vessels) (c) malignant disease.

2 Vessels in tonsil region (a) pulsating and tortuous ascending pharyngeal, internal carotid external carotid (b) aneurism of same vessels (c) angioma of fauces.

3 Blood states affecting coagulability of the blood (a) hæmophilia (b) purpura (c) anæmias [illegible] (temporary)

pituitary gland toxin

PROPHYLACTIC MEASURES

1 In children Exclude hæmophilia. If present, treat. In adults Exclude diseases mentioned above. If present, treat.

2 Increase coagulability of the blood Calcium lactate horse serum human blood serum, hæmoplastin congulose coagulin (Kocher Fonio) pitutrin.

3 Increase constriction of vessels in arrest of hæmorrhage (a) adrenalin, (b) pituitrin.

O M Rott M.D

McKenzie, D : The Treatment of Hæmorrhage in Tonsil Operations. *Brit M J* 1921 ii 440

with the side of a long straight pair of pressure forceps, pressing in the pillar between its jaws from in front with the forefinger of the disengaged hand The point of the forceps being free, a ligature can be easily thrown over it.

On the tonsil bed he frequently seizes the vessel with an old-fashioned pair of tongue forceps as it is easier to pass the ligature over the obtuse oval end of this instrument.

He does not favor suturing the faucial pillars or ligating the carotid.

If the bleeding points cannot be seen or secured McKenzie favors the use of the Watson-Williams [illegible]

O M Rott M.D

New G B : An Unusual Case of Bilateral Abductor Laryngeal Paresis. *Laryngoscope* 1921 xxxi, 630.

The author reports a case of bilateral abductor paralysis observed at the Mayo Clinic.

It has been demonstrated by Russell that the fibers supplying the abductor muscles of the larynx run in a distinct bundle on the inside of the recurrent laryngeal nerve and can be isolated and stimulated. Further it is known that on prolonged stimulation of the recurrent laryngeal nerve the abductor muscles are the first to cease their function and that clinically abductor paralysis due to involvement of this nerve or to central lesions is not uncommon

In the case reported, use of the voice for a fraction of a minute so tired the abductors that the onset of paralysis could be observed The patient was 64 years of age and for four years had suffered from chronic anterior poliomyelitis. He had atrophy and weakness of the lower extremities and to a less degree of the upper extremities, with beginning foot drop and fibrillary twitchings. The first laryngoscopic examination showed normally active cords. On repeated phonation the abductors on the right [illegible]

recovery was complete Paralysis was produced several times in the manner described and was noted by other observers. J W Ross, M D

MOUTH

Shearer W L.: The Pathology of the Mouth and the Surgical Principles of Its Removal. *J Radiol* 1921 ii 1

Shearer reports that in a large number of cases of chronic alveolar abscesses and other disease conditions of the teeth the removal of the teeth does not remove the condition as the latter usually involves the bone surrounding the teeth. He therefore recommends the following procedure

The muco-periosteum is reflected up to the root ends of the tooth sockets, the external alveolar plate of bone is taken off and the diseased area then removed The bone is smoothed, leaving no jagged edges, and the lingual buccal and gingival mucosa is trimmed and then sutured with horsehair The sutures are removed in from four to five days

In many cases antrum diseases are due to drainage into the sinus from an alveolar abscess around the root ends of non vital teeth The author claims that the following principles should govern the treatment of chronic infection in the maxillary sinuses

1 If the antrum disease is of dental origin, the dental pathology should be taken into consideration and removed

2 Well-established drainage must be considered

3 The type of the operation should be one whereby ocular observation of the entire antral cavity can be had in order that polypi may be removed. M N Freedman, M D

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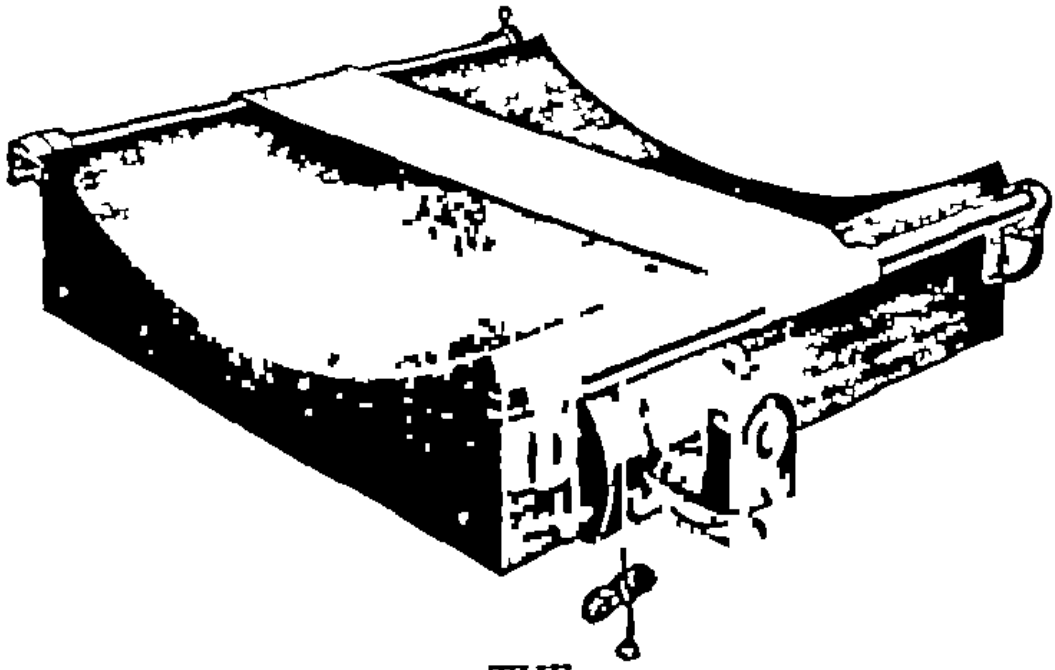
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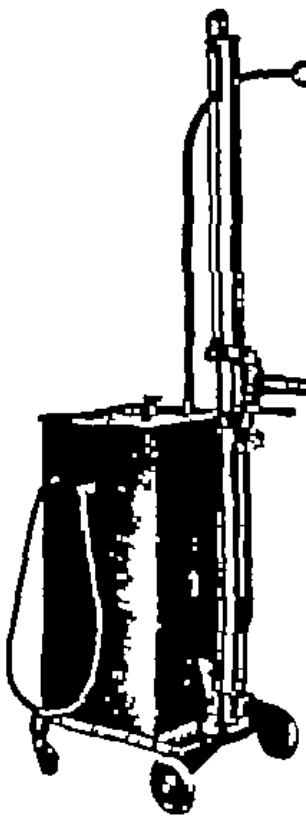


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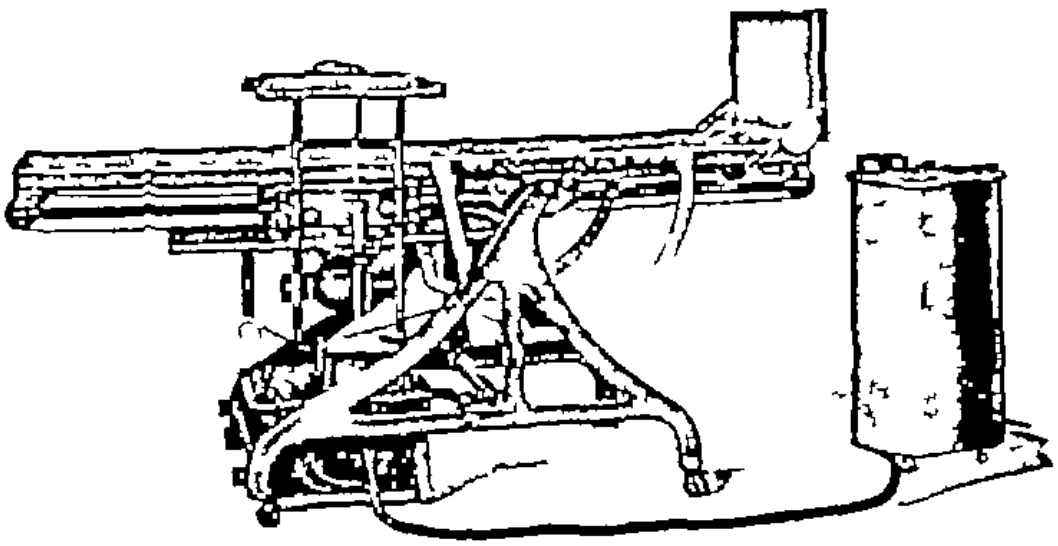
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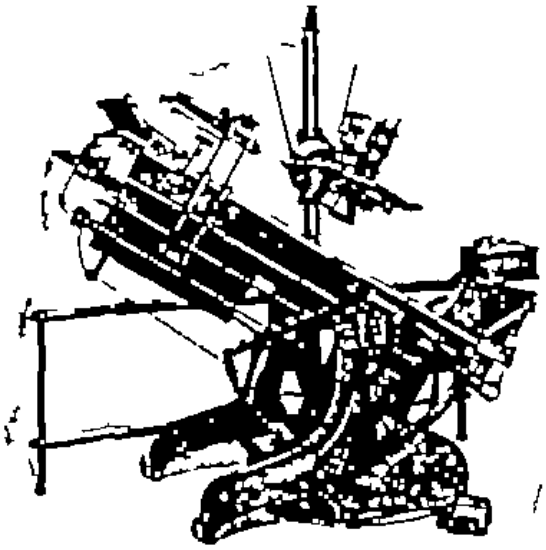


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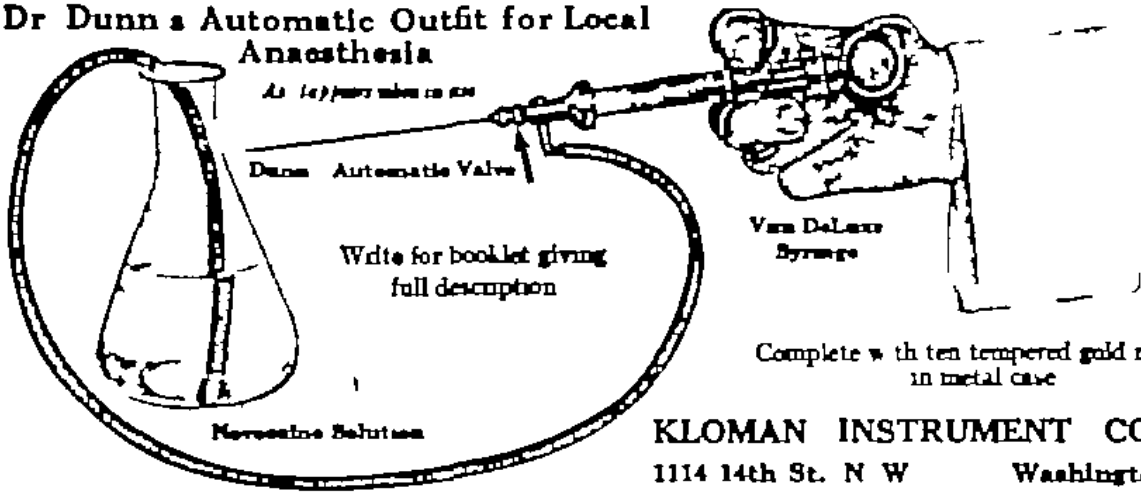
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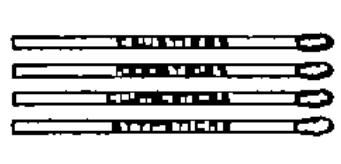
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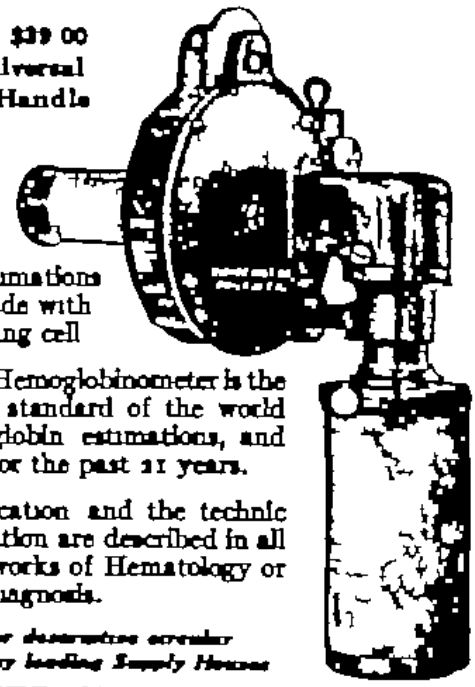
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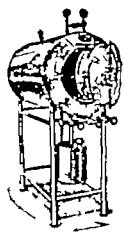
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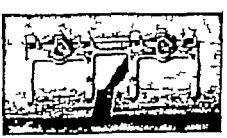
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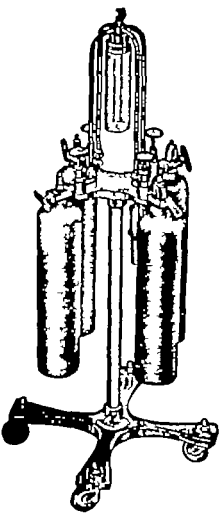
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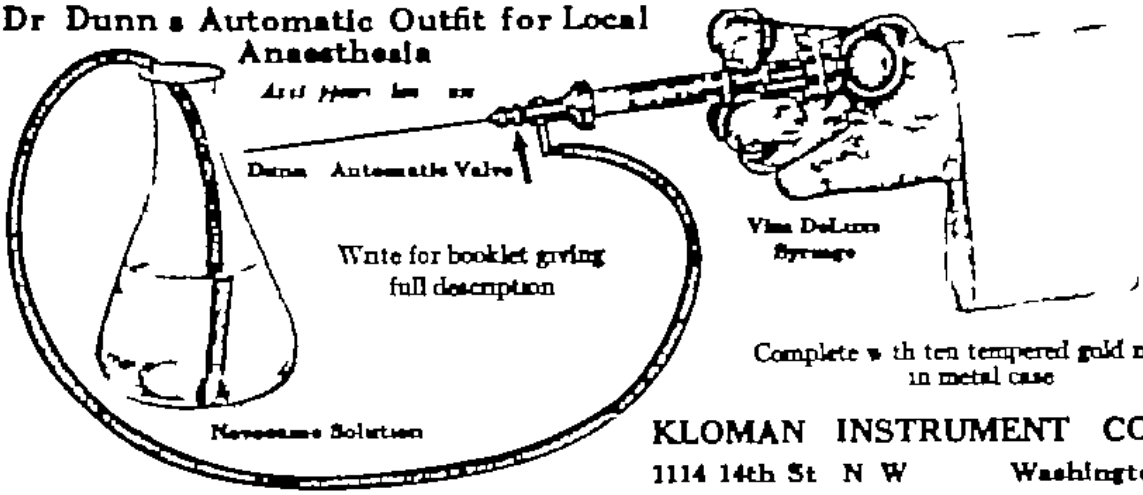
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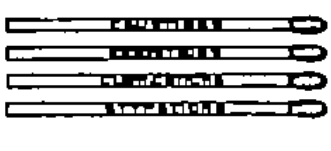
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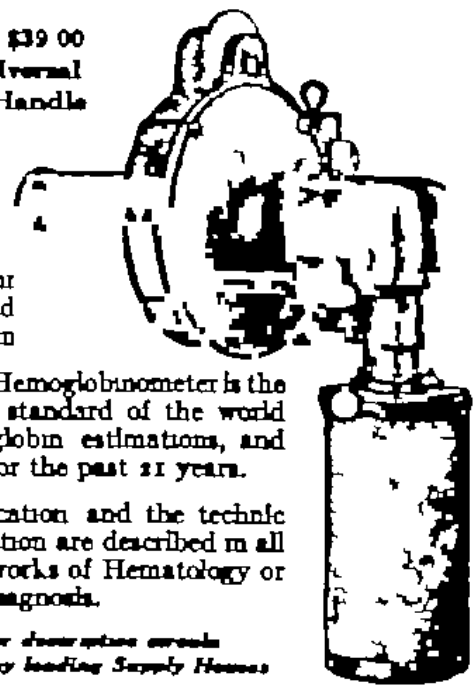
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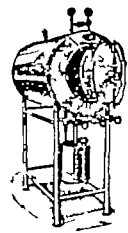
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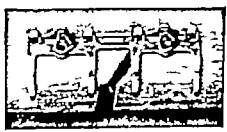
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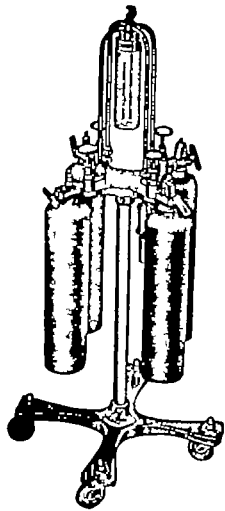
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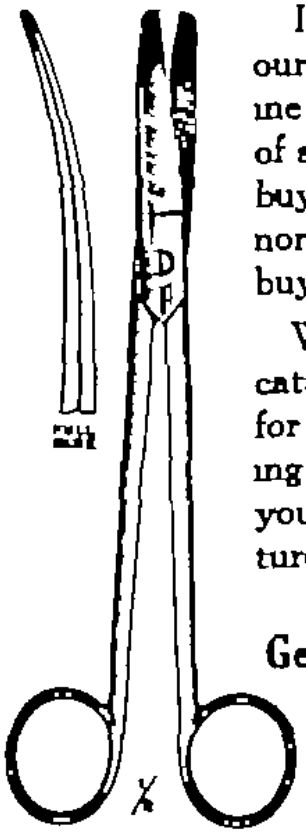


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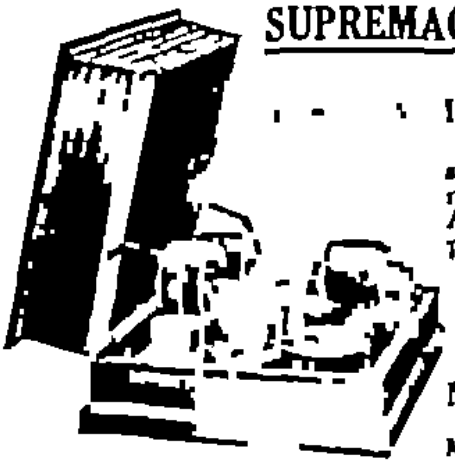
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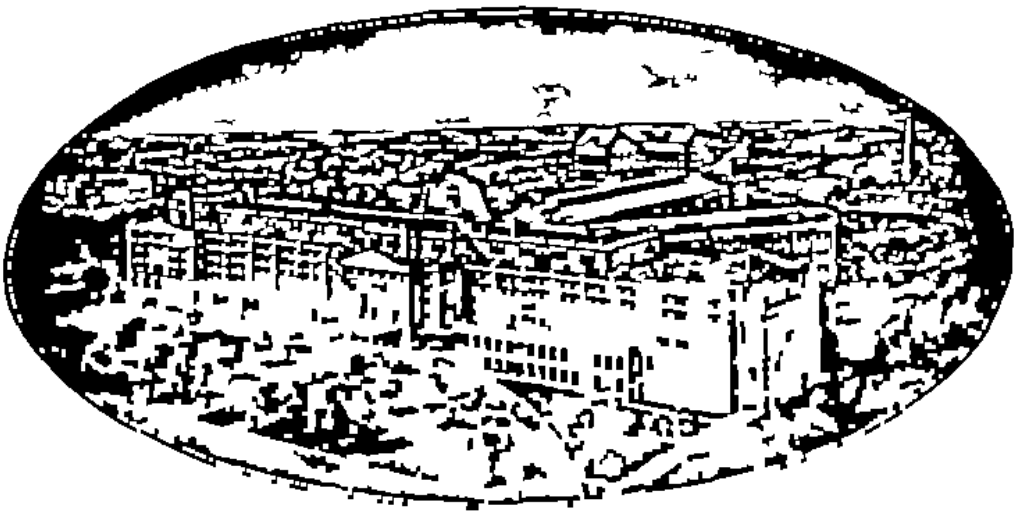
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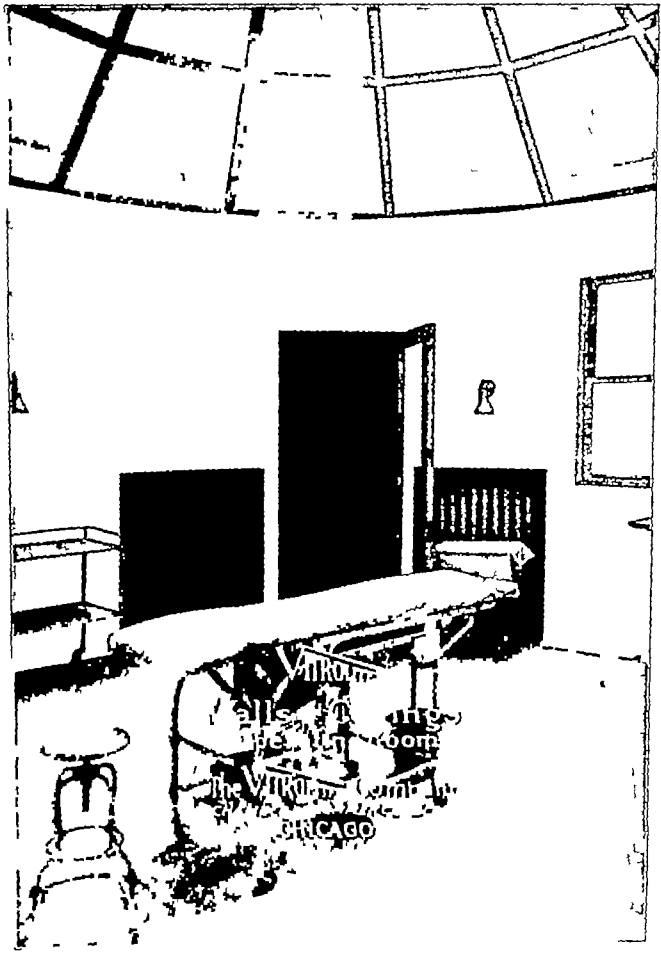
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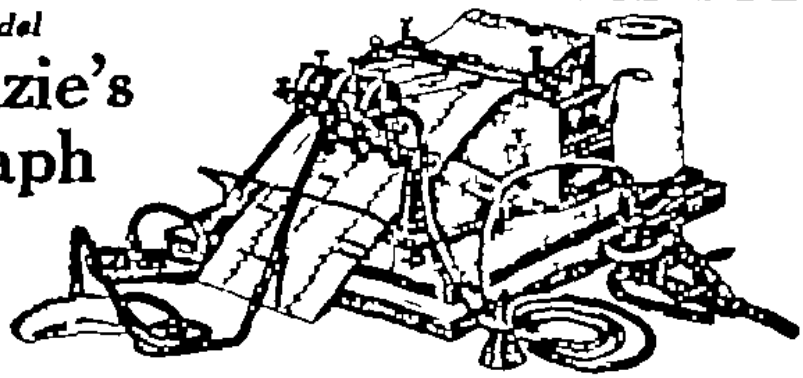
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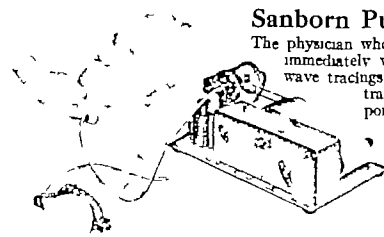
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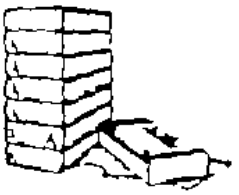
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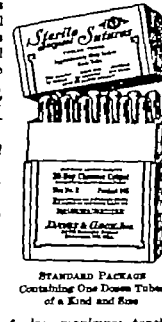
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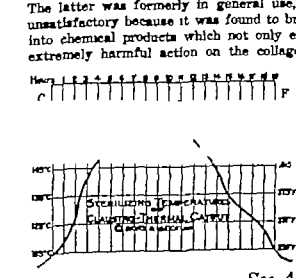


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These serious disadvantages of iodized catgut have been overcome through the use of potassium-mercuric iodide instead of iodine. This double salt of iodine and mercury the chemical formula of which is $HgI_2.2KI$, is one of the most active germicides known, exerting a killing action on bacteria about ten times greater than that of iodine. It does not break down under the influence of light or heat, it is chemically stable, and, in the proportions used, is neither toxic nor irritating to the tissues. It interferes in no way with the absorption of the sutures, and is not precipitated by the proteins of the body fluids.

Kalmerid catgut, in addition to its bactericidal attribute embodies all the essentials of the perfect suture. It is perfectly compatible with the tissues, its absorbability is dependable, and its tensile strength is particularly good.

TWO VARIETIES—To meet the requirements of different surgeons two kinds of Kalmerid catgut are prepared—the boilable, and non-boilable.

BOILABLE GRADE—This variety is prepared for surgeons who prefer a boilable suture, such as the Claustro-Thermal product, but possessing bactericidal properties in addition. The boilable grade, therefore, besides being impregnated with potassium-mercuric iodide, embodies the desirable physical characteristics of the Claustro Thermal sutures. It has the same moderate degree of flexibility it is the same in appearance it is tubed in the same improved storing fluid—toluol and, after impregnation with potassium mercuric iodide, it further receives the Claustro-Thermal sterilization—that is, heat sterilization after closure of the tubes.

NON-BOILABLE GRADE—This variety is extremely pliable as it comes from the tubes. It is made for those surgeons who have been accustomed to the flexibility of iodized catgut.

Reprints of original articles relating to Kalmerid sutures will be sent upon request.

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Each Tube Contains Approximately Sixty Inches

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20-Day Chromic	Product No. 1245	20-Day Chromic	Product No. 1445
40-Day Chromic	Product No. 1265	40-Day Chromic	Product No. 1465

SIZES 000 00 0 1 2 3 4

Please specify clearly the PRODUCT NUMBERS and SIZES desired

Kalmerid sutures are unaffected by age or light, or by the extremes of climatic temperatures

Price in U. S. A.

Per dozen tubes (subject to the discount given on preceding page) $3

In packages of twelve tubes of kind and size

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Two Varieties—Boilable and Non-Boilable

THESE are the sutures *par excellence* for those procedures in which post-operative tension is excessive, or long continued apposition necessary such as in herniotomy and in tendon and bone suturing. Kalmerid kangaroo tendons are not only sterile, but, in addition, they are impregnated with potassium mercuric-iodide which enables them to exert a local bactericidal action in the tissues. The impregnating and sterilizing methods are the same as practised in the preparation of Kalmerid catgut, and described on the preceding page.

They are genuine kangaroo tendons they are round, smooth, straight, of uniform contour and possess a tensile strength about twice that of the best catgut of equivalent size.

Because of their greater strength some surgeons prefer these tendons to catgut, particularly in the finer sizes, for general intestinal, muscle, fascia, and skin suturing.

ABSORPTION TIME—The tendons are chromicised, and so accurately is the chromicising process regulated that each size whether it be the finest or the coarsest, will maintain apposition in fascia or in tendon for approximately thirty days. Shortly after that period the sutures, with their knots, will be completely absorbed.

TWO VARIETIES—Kalmerid kangaroo tendons are prepared in two grades—boilable and non-boilable.

The NON BOILABLE tendons are extremely pliable and consequently require no moistening.

The BOILABLE tendons are quite stiff as they come from the tubes, but may be rendered pliable by moistening in sterile water preliminary to use. The smaller sizes will be sufficiently softened by fifteen minutes immersion, while the larger sizes should be immersed for about thirty minutes. Either sterile water or an aqueous bactericidal solution made with Kalmerid tablets—1 5000—should be used.

Before immersion, the toluol, which is very volatile should be allowed to evaporate so that the water may have access to the sutures.

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Each Tube Contains One Tendon Lengths Vary From 12 to 20 Inches

The Non Boilable Grade is *Product No. 570*
Boilable Grade is *Product No 580*

Sizes

Standardized Sizes	0	2	4	6	8
Former Tendon Sizes	Ex. Fine	Fine	Medium	Coarse	Ex. Coarse

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Actual Sizes

000
00
0
1
2
3
4
6
8

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IN conformity with the long recognized need for a unified system of sizes, the standard metric catgut scale has been extended to embrace all sutures, including kangaroo tendons, silk, horsehair silkworm gut, and celluloid linen thread.

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Product No.		Approximate Quantity in Each Tube	Standardized Sizes
350	Celluloid Linen Thread	60 Inches	000 00, 0
360	Horsehair	Four 28-Inch Sutures	00
390	Plain Silkworm Gut	Four 14 Inch Sutures	00, 0, 1
400	Black Silkworm Gut	Four 14-Inch Sutures	00, 0, 1
450	White Twisted Silk	60 Inches	000, 00, 0, 1 2, 3
460	Black Twisted Silk	60 Inches	000, 0 2
480	White Braided Silk	60 Inches.	00, 0, 2, 4
490	Black Braided Silk	60 Inches	00 1, 4
500	Catgut Circumcision Suture	30 Inches With Needle	00

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Minor Sutures

Short Length Without Needles

Sterilized by Heat After Closure of the Tubes

Product No.		Approximate Quantity in Each Tube	Standardized Sizes
862	Horsehair	Two 28 Inch Sutures	00
872	Plain Silkworm Gut	Two 14 Inch Sutures	0
882	White Twisted Silk	20 Inches.	000, 0, 2
892	Umbilical Tape	Two 12-Inch Ligatures	

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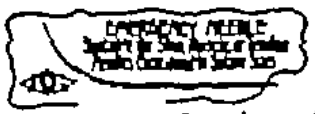
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Emergency Sutures

With Needles

Sterilized by Heat After Closure of the Tubes

Product No.		Approximate Quantity in Each Tube	Standardized Sizes
904	Plain Catgut	20 Inches	00, 0, 1 2, 3
914	10-Day Chromic Catgut	20 Inches	00, 0, 1, 2, 3
924	20-Day Chromic Catgut	20 Inches	00, 0, 1, 2, 3



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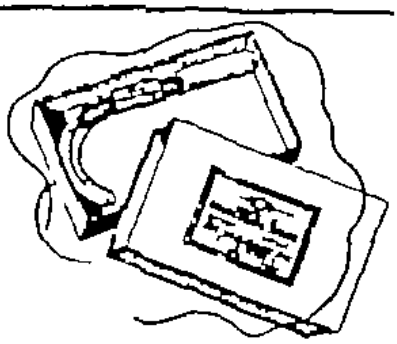
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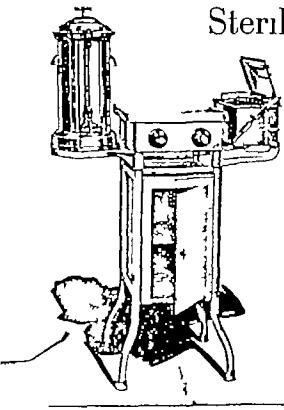
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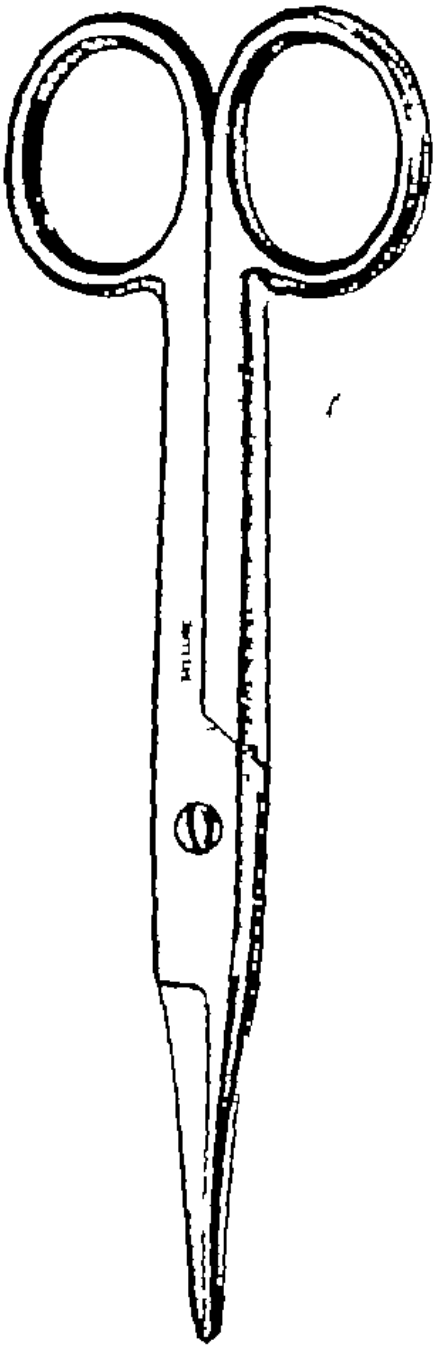
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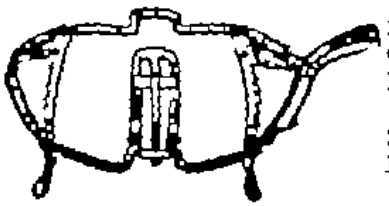
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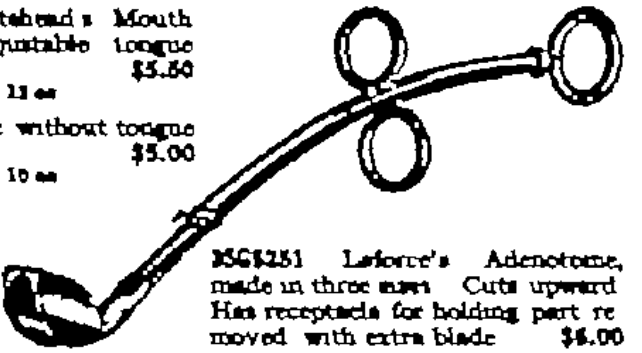


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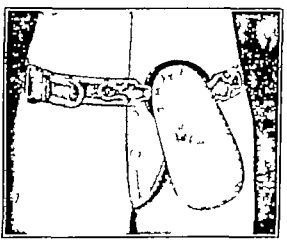


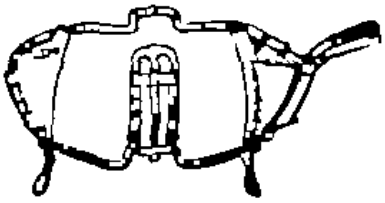
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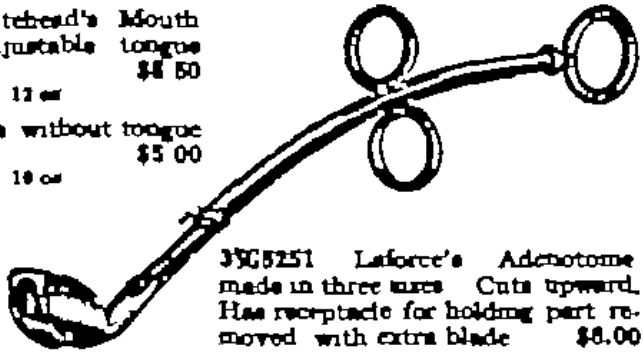


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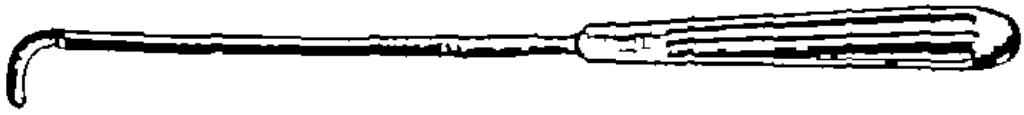
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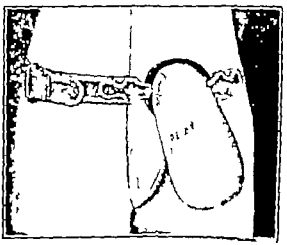


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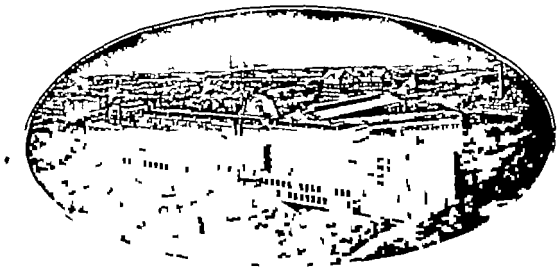
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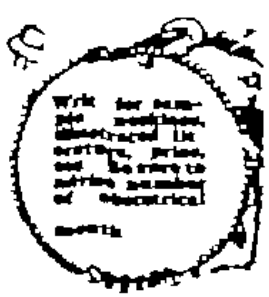
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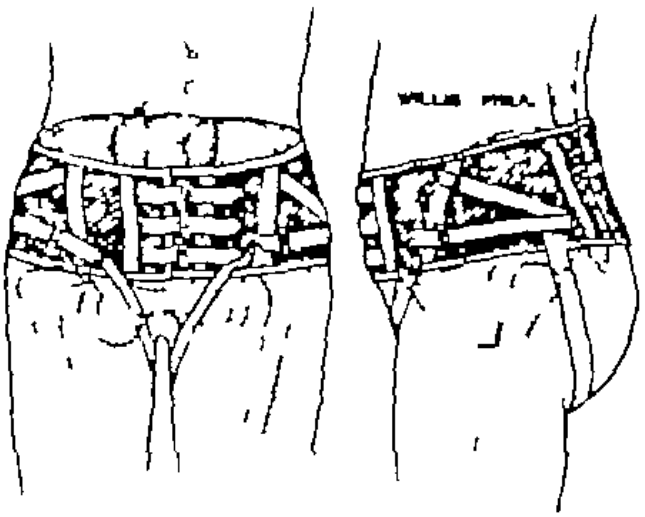


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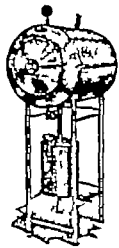
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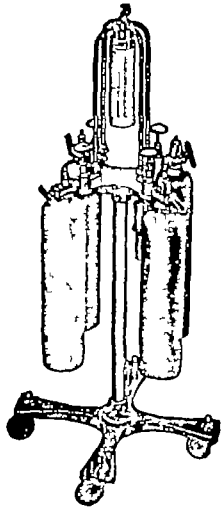
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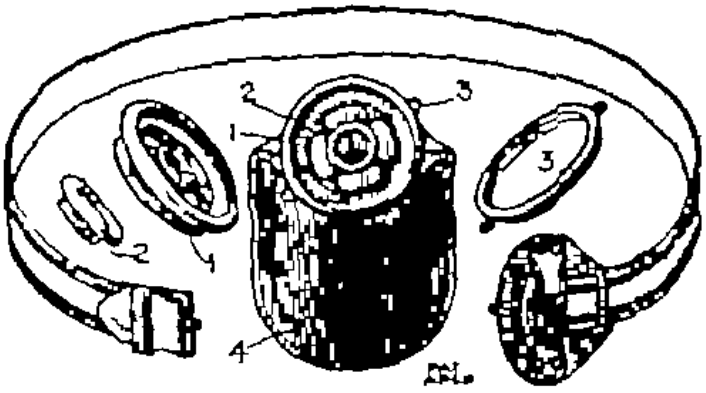
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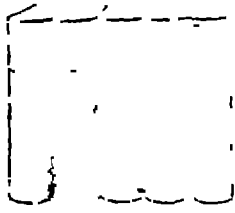
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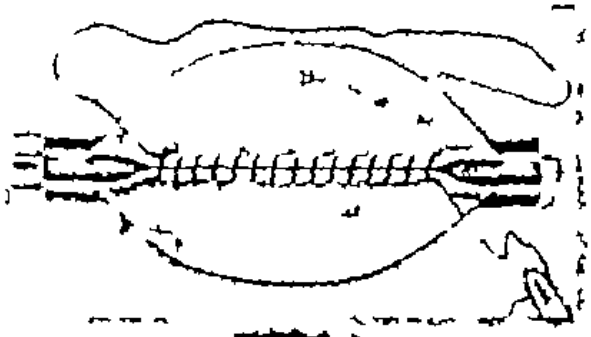
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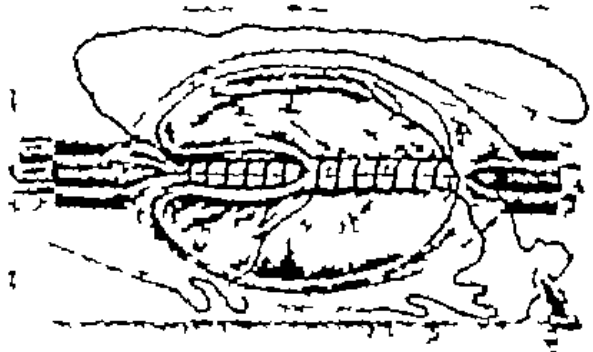
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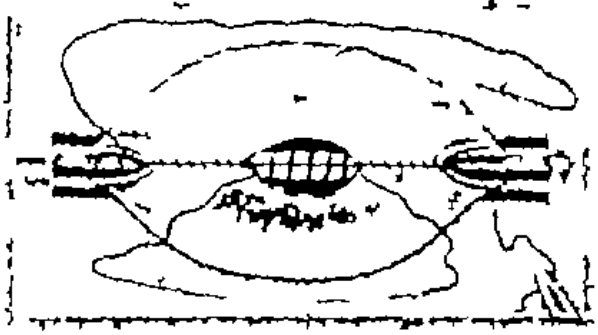
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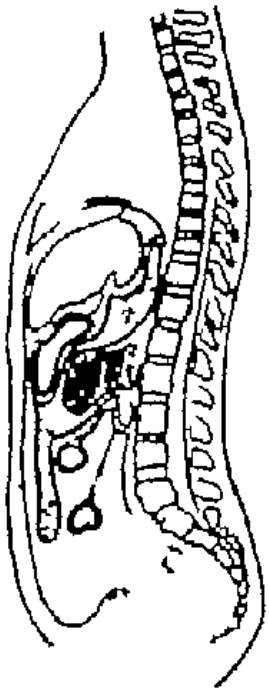


Fig. 1. Tumor of pancreas. Stomach in front, colon below

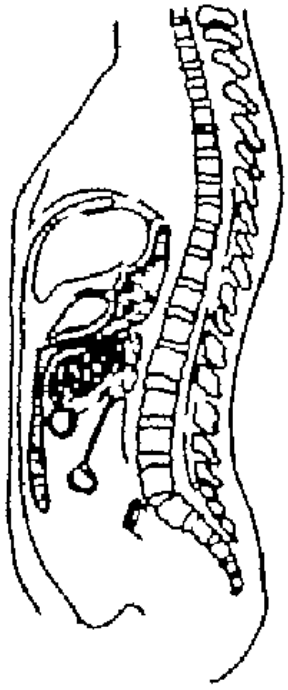


Fig. 2. Tumor of pancreas pushing forward between the posterior layer of the great omentum and the transverse mesocolon

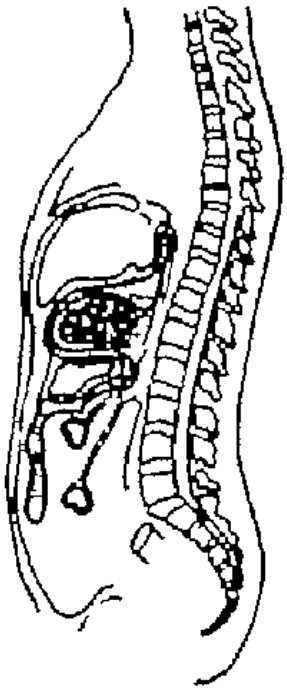


Fig. 3. Tumor of pancreas Stomach and colon both below

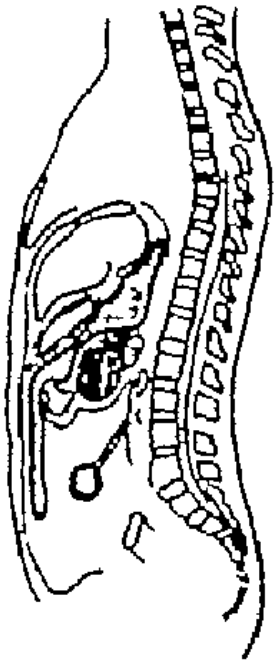


Fig. 4. Tumor of pancreas. Stomach and colon in front of it.

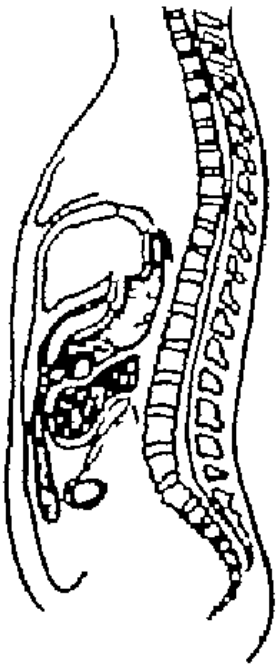


Fig. 5. Tumor of pancreas. Stomach and colon both above it.



Fig. 6. Tumor, cyst of pancreas. Stomach, colon, and small intestine above and in front of it.

(Figures 1, 2, 3, 4, and 5 from Robson and Moynihan.)

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SURGERY, GYNECOLOGY AND OBSTETRICS

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PANCREATIC CYSTS AND PSEUDOCYSTS

REPORT OF A CASE OF TOTAL EXTIRPATION BY AN EXTRAPERITONEAL METHOD

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CYSTS of the pancreas are comparatively rare affections The number of operations upon abdominal viscera, the world over is now so enormous that even this rare condition has been encountered many times and individual cases being of special interest have been reported in the literature It is therefore possible to study an extremely varied series of cases since Virchow described retention cysts of the pancreas in 1863

The classification suggested by Robson and Moynihan in 1903 was as follows

1 Retention cysts,
2 Proliferative cysts—
Cystic adenoma
Cystic epithelioma,
3 Hydatid cysts,
4. Congenital cystic disease,
5 Hæmorrhagic cysts,
6 Pseudocysts.

To this list must be added dermoid cysts as the result of a recent communication by Judd in which he describes a cyst arising in the body and tail of the pancreas containing hair and one tooth With this addition, however the classification of Robson and Moynihan still holds good

The association of acute and chronic pancreatitis with the formation of these cysts is well established and, in turn the relationship between infection in the gall bladder and bile ducts as an etiological factor direct as to pancreatitis and indirect as regards cyst formation, must be taken into account In fact, it is asserted that the most common cause of cyst is chronic interstitial pancreatitis due to pressure on the ducts of the contracting connective tissue (Cammidge) It is suggestive that biliary colic and jaundice have been recorded as symptoms preceding cyst formation Such a case was reported by McPhedran as long ago as 1897 Castronuovo reports a cyst of the tail of the pancreas in a man 60 years of age a syphilitic who had hepatitis and perihepatitis with moderate icterus lasting 6 weeks. Ten months later he removed the cyst along with a necrosed portion of the pancreas Ballin and Saltzstein have recently reported a case which clinically showed pancreatitis, cholelithiasis cholecystitis, and subsequent to cholecystectomy the development of a pancreatic cyst, containing 4 quarts of brownish thin fluid The gall bladder was removed because it was filled with stones Some confusion at the moment exists regarding the correct method of utilizing our knowledge concerning the relationship here established Thus Judd has noted the fact that cholecystectomy has effected a cure in certain cases of pancreatitis. He explains the sequence of events as follows After cholecystectomy the bile dams up in the extrahepatic ducts causing dilatation, as this continues

the walls of the ducts hypertrophy until finally the resistance offered by the sphincter of Oddi at the entrance to the duodenum is overcome and a continuous flow of bile and pancreatic secretion into the duodenum ensues. On the other hand McWhorter argues in a logical fashion that the removal of the gall bladder reducing as it does the pressure within the bile ducts produced by the expulsive force of the muscular wall of the gall bladder must effect a condition in which the pressure is not sufficient to overcome the resistance of the sphincter of Oddi The result may cause regurgitation of the bile into the pancreas and the production or aggravation of pancreatitis While recognizing the results obtained by Judd we must consider the possibilities suggested by McWhorter particularly in view of the case reported by Ballin and Saltzstein, and we are inevitably forced to the conclusion that Archibald is right in arguing from his experimental and clinical evidence, which is most convincing that prolonged drainage of the common bile duct in cases of pancreatitis is essential to effect a permanent cure This may be accomplished with or without cholecystectomy Koerte has reported a case in which after providing drainage of a pancreatic cyst he endeavored to establish drainage of the bile ducts by a cholecystenterostomy the anastomosis being accomplished between the gall bladder and the jejunum In this case the gall bladder at the time of operation contained 35 stones

In many instances of pancreatic cyst formation there is a history of trauma. Kellock remarked on the frequency with which a kick from a horse on the abdomen was followed by this condition Duschl records the case of a soldier who had a laceration of the duct of Wirsung as the result of a sharp blow over the stomach This resulted in the formation of a cyst from the head of the pancreas Not an unusual course of events is that described by Murray

A boy age 9 was run over by a delivery wagon This caused a slight laceration of the pancreas producing hemorrhage and the escape of pancreatic juice into the lesser sac of peritoneum. This was followed by a mild form of peritonitis resulting in the closure of the foramen of Winslow The lesser sac became distended and a pancreatic cyst thus developed The lad was operated upon 5 weeks after the accident and recovered

There are a number of instances in the literature of pancreatic cysts occupying the lesser sac of peritoneum Walker reports an unusual case of a man suffering sudden acute abdominal pain after severe muscular effort Three weeks subsequently a cyst containing 2 pints of pancreatic fluid was found in the lesser sac of peritoneum

Koerte proposed the term pseudocyst for a fluid tumor found in more or less close proximity to the pancreas but not originating in the substance of the gland the most frequent examples being those of effusion into the lesser sac of peritoneum as the result of injury to the pancreas There is a great deal of confusion in recent literature in the use of the term pseudocyst thus Koerte himself in a paper published in 1911 speaks of a pseudocyst as developing in a case of pancreatitis However he believed that a chronic interstitial pancreatitis might result from injury Others reserve the term for a pancreatic cyst having no epithelial covering containing fluid surrounded by a wall of connective tissue formed within the pancreas or in contact with its surface the contents being in part at least products of pancreatic secretion (Opie) The term pseudocyst has been restricted by Willis and Budd to those resulting from trauma These have otherwise been called apoplectic cysts in which as the result of the injury to the pancreas hemorrhage occurs and ferment may escape The cyst wall is composed of dense fibro-elastic tissue It is true that many cysts of the pancreas are lined by cylindrical epithelium but, on the other hand the wall may be entirely devoid of epithelium Koerte asserts that in true cysts the epithelium is often destroyed by the destructive effects of the pancreatic juice laying bare the underlying connective tissue He remarks

would consider the best defense against digestion to be the intact epithelium.

The existence of the products of pancreatic secretion in the cyst contents has been frequently noted. On the other hand

numerous instances of true cysts are on record where no ferments are found Opie states "The presence in cystic contents of one or more enzymes resembling those of the pancreas was formerly believed to give proof that a cyst had its origin in the pancreas Not infrequently one or perhaps all of these enzymes are absent in the contents of a pancreatic cyst whereas fat-splitting, diastatic, or proteolytic enzymes are found in fluids not derived from the pancreas '

To establish the diagnosis of a pancreatic cyst the presence or absence of ferments would, therefore, appear to be of relatively little value, one must rely chiefly upon the anatomical relationship of the cyst to the pancreas The occurrence of pancreatic tissue in the cyst wall would of course be conclusive, while the presence or absence of an epithelial lining is of little or no value in diagnosis

The cyst may be unilocular or multilocular they may be single or multiple. Bolt has recorded a case of polycystic disease of the pancreas In this case the right kidney was also polycystic Koerte has described a multilocular cystadenoma and Speese reports an unusual condition of a proliferating cystadenoma of the pancreas with extension to the abdominal wall 10 years after drainage of a pancreatic cyst. Hydatid cysts of the pancreas are recorded in the literature An interesting case of this nature was recorded by my former colleague the late Dr George A Peters who succeeded in reaching the cyst by an incision through the loin and in effecting cure by evacuation and drainage Par lavecchio obtained a cure in hydatid cyst of the tail of the pancreas after marsupialization and drainage

The case which I have to record is a pancreatic cyst discovered in a woman immediately after the birth of her child at full term There was no previous history to indicate its presence, it was of large size invading the pelvis, and was mistaken for an ovarian cyst Total extirpation was done with complete recovery Following is a complete history of her case

Mrs B age 32 a strong healthy woman was delivered of a child at full term on January 28 1912 Prior to delivery the size of the abdomen was such that her physician in attendance thought it was a twin pregnancy This belief was not dispelled when on the birth of the child, the abdomen remained large. It was soon discovered however that a large cyst filled the abdomen extending from the costal margin above downward into the pelvis This cyst was diagnosed as ovarian in origin and the writer was summoned to remove it, 6 weeks after delivery On my arrival at the farm house the patient had already been prepared for operation but through the sterile towels one readily detected a large abdominal cyst. It was dull on percussion immediately above the pubes and in the flanks. It appeared somewhat elongated and did not present the characteristic spherical appearance of an ovarian cyst Its long axis was somewhat oblique from above and in the left downward toward the center of the pelvis. The umbilicus was absolutely flat and showed no puckering possibly this condition was produced by the great distention during pregnancy

On opening the abdomen I exposed the cyst which extended far down into the pelvis. I passed my hand below it and found it had no pelvic connections whatever A layer of tissue lay over the cyst wall proper which proved to be the posterior parietal pentoneum. The small intestine lay above it and it soon became obvious that one had to deal with a retroperitoneal cyst which had developed downward and forward behind that portion of the parietal pentoneum which lies below and to the left of the attached portion of the mesentery of the small bowel. The right kidney and the spleen were in normal position I incised the single layer of peritoneum which lay as a superficial covering over the cyst wall proper The edges of the opening which I had thus made in the posterior parietal peritoneum were carefully stitched by continuous catgut suture to the edges of the opening which I had made in the anterior parietal peritoneum when I cut through the abdominal wall at the first. By this means I marsupialized the peritoneum, and by so doing I completely shut off the general peritoneal cavity while at the same time the cyst partially bared of its pentoneal covering lay in the bottom of my wound I now proceeded to enucleate the cyst from its bed This, to a certain point was accomplished without much difficulty, but the posterior part of the cyst wall could not be reached I therefore punctured the cyst with a large sized trochar and cannula, and drew off 5 litres of pale chocolate colored fluid of the consistence of pea soup. I now continued the enucliation of the flaccid cyst wall as I approached its base above and to the left it became more dense and more firmly connected so that many vascular bands required ligation Finally I narrowed it down to a pedicle containing an artery slightly larger than the radial and a vein as thick as one's forefinger This pedicle lay to the left on a level with the body of the first lumbar vertebrae and was attached to the tail of the pancreas. I first separated the artery and ligated it the vein with some adjacent tissue was then similarly

secured. The stump was sewn over by continuous catgut suture In the cavity which remained I palpated and identified the left kidney When the oozing from the cavity ceased I secured a drainage tube in place and otherwise closed the wound by silkworm-gut sutures through skin, muscle and aponeurosis.

The operation lasted one hour immediately after her return to bed the patient s pulse was 80 per minute and her general condition excellent

The cyst wall was subsequently examined by Dr O R. Mabee and was found to be composed of fibrous tissue without evidence of any more specialized type of tissue

The contents of the cyst were analyzed by Professor J B Leathes, who reported as follows The greenish, more or less opaque, fluid contained diastase in fair amount, but no evidence of trypsin or any proteolytic enzyme nor of lipase No urea was found but a small quantity of sugar by reduction test

Dr M K Dillane who referred this patient to me made careful inquiry into the previous history of the patient As a young woman she suffered four or five times a year from inflammation of the bowels, each attack lasting a day or two She has been free from these for the last 8 or 9 years She had acute rheumatism 10 years ago She has never had any other illness

It is now 9 years since I removed the cyst. She has enjoyed excellent health and on December 27 1915 5 years and 9 months after the operation, she was delivered of a child at full term There had been no discomfort during gestation and the parturition was normal in every way The patient has remained perfectly well and no weakness has developed in the abdominal wall

The treatment of a pancreatic cyst by marsupialization has been advocated and carried out many times In this operation the cyst wall after exposure is sutured to the anterior abdominal wall, preferably to the skin, and the cyst is then opened and drained In the case which I have just described however the marsupialization was accomplished by suturing an opening in the posterior parietal peritoneum to an opening in the anterior parietal peritoneum The cyst wall was now attacked and was dealt with entirely outside the peritoneal cavity which had been shut off from the field of operation by the method described As far as I have been able to discover this method of uniting the opening in the posterior parietal peritoneum to the opening in the anterior parietal peritoneum has not hitherto been suggested or described in the treatment of pancreatic cysts Hitherto it has been the wall of the cyst which was sutured in the process of marsupialization while in the method suggested and successfully carried out by me the peritoneum alone is sutured and the cyst wall is not included in the process

Complete extirpation of a pancreatic cyst was first done by Toreman in 1882 and since then has been successfully accomplished many times. Such cases have been described by Koerte Willis and Budd McCann, Moschcowitz, Rolc deFrancisco Alexandrow Gobell, Chand, and others. Mason records a remarkable case in which he removed three fourths of the pancreas along with a cyst which had contained 4 quarts of fluid Koerte quoted Gobell as stating in 1907 that the mortality after total extirpation was 10 7 per cent and after incomplete partial extirpation 55 5 per cent The much higher mortality in the latter cases was accounted for by the insurmountable difficulties encountered in separating the cyst from neighboring organs (stomach transverse colon, etc) and from great blood vessels and the damage done in the attempt to do so In endeavoring to free a cyst the colon has been torn adhesions to the stomach duodenum or liver have precluded the possibility of enucleation The portal vein has been found firmly embedded in the cyst wall (Robson and Moynihan) On the other hand the cyst may present no adhesions of moment such was the case in the instance reported in this paper

There are two factors to be considered regarding the anatomical relations of the cyst first its point of origin from the pancreas and second the relations established by the cyst as it enlarges and invades the abdomen. Regarding the first point it may be stated that a cyst may arise from any portion of the gland head body or tail. The tail of the gland is the most common seat of origin The connection with the pancreas may implicate a wide area of the gland or it may be reduced down to a narrow pedicle. As to the relations established as the cyst enlarges one may state that occasionally it comes forward between the liver and stomach it may push the stomach immediately in front of it it may come between the stomach and the transverse

colon, it has been found between the two leaves of the transverse mesocolon, or again it may pass out below the transverse colon The relationship established in my case must be unusual, in fact I have not been able to discover a similar instance The cyst developed below and to the left of the parietal attached portion of the mesentery of the small intestine On opening the abdomen the small intestine, transverse colon, and stomach all lay above the cyst It is not surprising that a cyst developing from the tail of the pancreas should develop in the direction here indicated, the normal line and extent of attachment of the mesentery of the small bowel would readily permit it. The original diagrams of Robson and Moynihan (Figs 1 to 5), which have been so frequently copied by other authors, are faulty in that they represent the possibilities of spread in the middle line only The diagrams are those of a vertical sagittal section passing through the center of the bodies of the vertebræ I have added a diagram (Fig 6) taken from a frozen section of the body to the left of the spine and I have incorporated in this diagram the development of the cyst in my case, arising from the tail of the pancreas and spreading downward below and behind the small intestine There are numerous instances on record in addition to my own where a pancreatic cyst has been mistaken for an ovarian cyst (Robson and Moynihan, McCann and others)

The most common method of treatment hitherto employed for pancreatic cyst has been incision and drainage, with or without a preliminary marsupialization of the cyst wall Robson and Moynihan refer to a remarkable case reported by Hagen in which the operator could reach the cyst only through the stomach He divided first the anterior wall of the stomach and then the posterior wall. The cyst behind the stomach was then incised He introduced his finger into the cyst and displacing the stomach somewhat to the right, he succeeded in bringing a part of the cyst wall in contact with the parietal peritoneum To this it was sutured and here drainage was established The incisions in the stomach wall were sutured. The patient, a child of 13 recovered Veller (quoted by Kerr) gave a record of 13 cases operated upon by evacuation and drainage in two stages, all the patients recovered Drainage through the loin, as in Peter's case has been recommended by some surgeons Drainage of the ordinary type of pancreatic cyst usually results in a cure but a troublesome fistula may persist for a long period and the secretion therefrom may be of a very irritating character (McPhedran, Koerte, Walker, etc)

Pancreatic cysts have been found at all ages from young infants to individuals of three score years and ten The most common period according to statistics of Koerte is in the third and fourth decades. Telling and Dobson describe a case in an 11 months old child and these authors quote Railton as having recorded a case in an infant of 6 months It would appear that they occur about equally in men and women It is noteworthy that in several instances they have been discovered in women after confinement (McCann, Mayo) The significance of the relationship here is not apparent in my case the cyst had attained large proportions and yet its existence was not suspected until immediately after the birth of a full time child

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THE DIAGNOSIS AND TREATMENT OF SOME COMMON INJURIES OF THE SHOULDER JOINT[1]

BY ROBERT W LOVETT M.D F.A.C.S. BOSTON

As the peculiar manifestations of injury and inflammation in the shoulder joint seem conditioned by its peculiar structure, it may be permissible first to review certain anatomical and mechanical conditions existing in it as a preliminary to the consideration of the clinical manifestations.

1 The shoulder joint in the quadruped acts as a weight bearing joint, but in the course of evolution it has ceased to bear weight and in the upright position must support the weight of the arm—in the adult probably amounting to 10 or 15 pounds It, therefore, has become transformed from an asset to a liability This considerable weight for the great part of the time drags more or less vertically down upon the joint because in the upright position the humerus is, most of the time, at the side, while the elbow and wrist are much in action in daily life and carry much less weight. The important practical point is that the shoulder supports a very considerable weight and is a purely hanging joint.

2 This weight is not supported by the capsule to any large extent, but by the muscles, mainly the biceps the triceps, coracobrachialis, and deltoid If these are paralyzed the humerus drops away from the acromion, and in the cadaver if these muscles are divided the humerus falls away about an inch In no other joint in the body do ligaments fail to hold the joint in place against gravity

3 The joint possesses the greatest range of motion of any of the joints and is movable in all directions, and at no one time is any considerable part of the head of the humerus in contact with the shallow glenoid cavity Extremes of motion are checked by capsular and ligamentous tension and support by the tendons of certain muscles.

4 The shoulder joint is not firmly connected with the skeleton, but is mounted on a movable base, the scapula. Abduction of the arm depends on fixation of the scapula and before the movement can be made the trapezius and rhomboids pectoralis minor and serratus magnus must hold the scapula firmly, and when even the trapezius is paralyzed, abduction of the arm is slight or absent even if the deltoid is good This relation of the scapular muscles to all shoulder motion is important and is the dominating consideration in estimating the effect of ankylosis of the joint, because although ankylosis in abduction is the position of choice with a movable scapula if the scapula is immobile for any reason fixation in abduction is a calamity

5 The relation of certain muscles to the joint structures is most intimate, and most important to remember The tendon of the subscapularis is closely merged with the front of the capsule and between it and the capsule at one point is a bursa communicating with the joint The long head of the biceps passes through the joint capsule encased in a synovial tube The supraspinatus tendon passes across the upper part of the capsule to which it is adherent, to be inserted into the greater tuberosity The infraspinatus tendon passes across the posterior surface of the capsule, and the deltoid muscle is separated from direct contact with the joint only by the subdeltoid bursa, and the tendons mentioned

6 The subdeltoid or subacromial bursa is about the size of a silver dollar, but this is variable and does not generally communicate with the joint, but it lies very close to it, its floor being separated only by the tendons of the short rotators Its base is formed by the tuberosity of the humerus and the tendons of the rotators, and its roof is attached to the acromion and acromioclavicular ligament. Its relation with the joint structures is, therefore most intimate The bursa under the subscapularis has been mentioned

[1] Read by invitation before the Chicago Surgical Society December 2 1911 (For discussion see page 553).

there is also one under the infraspinatus tendon and several others of minor importance

7 The final point of surgical importance is the muscular balance. We have two very powerful muscles—the pectoralis major and the latissimus dorsi which pull the arm in to the side by a direct straight pull We have one large and one smaller muscle—the deltoid and supraspinatus, which pull the arm away from the side, both of the latter working under unfavorable conditions of leverage and dependent even then on the fixation of the scapula by the trapezius, and other muscles. Moreover the first action of the deltoid must be to lift the arm vertically until the head of the humerus impinges on the upper part of the joint before it can become an abductor the supraspinatus is however an abductor from the start as can be seen from its line of pull In short, the effect of muscular balance is to favor an adducted position of the arm

Briefly then we have a weight-carrying loose ball-and-socket joint, kept in contact in large part by muscular action, and this joint is most intimately connected with important tendons and bursæ which enter into its structure Injuries must be complex in most cases from the purely geographical association of many different structures

It is not necessary to do more than to define the cases under consideration for every clinic is haunted by them and every surgeon sees them constantly the picture being familiar to all. After a wrench or overuse of the shoulder, perhaps after exposure to cold or in connection with some slight systemic infection the shoulder becomes painful and irritable it soon becomes impossible to abduct the arm to its full extent actively and pain is likely to be felt at the insertion of the deltoid at the outer aspect, especially in the later stages Active or passive rotation becomes restricted and uncomfortable but forward motion persists after the other motions have disappeared. The arm becomes especially painful at night, and it wakes the patient when he turns on his side. While the stiffness remains incomplete the two most painful motions are to fasten the suspender buttons or skirt bands at the back, and to fasten the collar at the back of the neck. As the affection progresses the arm becomes stiffer in the more acute cases and the only abduction allowed is that obtained by the motion of the scapula, and the patient learns to hold the elbow up and close to the side with the other hand Atrophy of the arm and shoulder muscles occurs A most uncomfortable condition results, and there is little tendency to spontaneous improvement so that the patient and sometimes the surgeon become discouraged

DIAGNOSIS

In many localities the diagnosis of subdeltoid bursitis is the usual one made in these cases and I quote Codman's view who has been a pioneer in the study of this subject

More patients seek hospital treatment for lesions of the subacromial bursa than for all other lesions including tuberculosis and fracture taken together And again the following quotation may be made I believe that it will be found that most minor lesions of the shoulder joint involve the bursa and few involve the true joint The very great frequency with which this diagnosis is made, in some parts of the country at least, leads to the question, for reasons which will be given whether it does not belong to a class of stock diagnoses often made by surgeons on what would seem to be insufficient evidence A torn ligament is often diagnosed where the evidence would seem to warrant only the term sprain, yet the explanation that the ligament is torn seems to the patient to warrant discomfort for months, really often only the result of a badly treated simple sprain. The term 'neuritis' is very carelessly used by surgeons for the explanation of all sorts of pain, and is very popular with the laity who make the diagnosis themselves with great freedom imposing on a surgeon, who sees much of the surgery of chronic cases, a large burden in the way of explanation. "Dislocation of the sacro-iliac joint is a very popular diagnosis in many parts of the country but so far X-ray and pathological evidence of its existence except from great trauma, is wanting Dislocation of the semilunar cartilage of the knee is an easy

explanation of slow and obscure knee joint injuries In place, therefore, of using the diagnosis of subacromial bursitis as the routine one in these injuries we will do better to look further and see if a more exact and descriptive diagnosis cannot be reached For this purpose it is important that any data which we have for identifying and localizing injury of this region should be used with a view of obtaining accurate information

In many shoulder joint injuries so many structures are involved that it is impossible to identify any one as the especial one involved, and it may be necessary in these cases to use the time-honored term 'sprain" in speaking of the acute cases, and in the chronic cases to resort to the old diagnosis of periarthritis, which is at least descriptive and a better guide to treatment than the assumed diagnosis of the involvement of some special structure, if such diagnosis can not be established by adequate clinical evidence But an accurate anatomical diagnosis can only be made when the injury is confined to special structures, and we must use the anatomical data in our possession for this localization

Sprain A sprain may be due to a stretching or tearing of the capsule or ligaments, to injury of the synovial membrane, or to the extravasation of blood into the tendon sheaths or any of the structures surrounding the joint. The grave after-effects of sprain or periarthritis as one may call it in the later stage, are also most manifest in the limitation of abduction and rotation, and the irritating effect of the weight of the arm as already mentioned

Muscular strain If a definite muscle suffers from strain it will be painful if it is actively contracted, and still more painful if the voluntary attempt to contract it is resisted or if it is passively stretched, and the pain is most likely to be referred to either the origin or the insertion of the muscle If any fibers have been ruptured, there is likely to be also acute pain on pressure at the spot of rupture and a varying amount of hemorrhage at the same site. If many muscular fibers are torn and the muscle is superficial a prominence may occur at the site of the rupture when the muscle is put into action This prominence cannot be found, and the signs of hemorrhage are less clear in rupture of the deeper muscles

The most common muscles about the shoulder joint to be strained are the deltoid the biceps, and the internal rotators while the external rotators are rarely seriously injured in this way In the case of the deeper muscles the diagnosis must be made chiefly by impairment of function and pain on use as described It must be remembered however, that in the involvement of the shoulder muscles passive motion in a certain direction may be allowed, while the active motion is painful This is particularly noted in abduction when the surgeon may often lift the arm from the side without pain but if the patient attempts to hold it in this abducted position severe pain is felt at the insertion of the deltoid muscle

To make an accurate diagnosis of muscle strain one must have fresh in his mind the action of the most important muscles which may be mentioned The *deltoid* raises the arm from the side, but it is assisted in so doing by the supraspinatus muscle so that limitation of abduction does not mean necessarily that the deltoid is affected because tenderness at the insertion of the supraspinatus muscle will also limit abduction It must be remembered also in making the diagnosis of deltoid strain especially in the later cases that immediately following the injury muscular atrophy begins and of all the muscles supporting the arm the deltoid suffers most and the pain so commonly experienced at the insertion of the deltoid in shoulder joint injuries is an instance of this That is to say, strain of the deltoid unless detected immediately after the accident, may be the result of the drag of the weight of the arm on the deltoid and complicate the picture.

The biceps The function of the biceps is three-fold to flex the forearm on the arm to supinate the forearm and to raise the whole arm forward from the frontal plane of the body To detect injury of the biceps tendon one starts with attempted flexion contraction of the muscle with the arm at the side and the movement resisted The

movement of supination of the forearm should cause pain at the site of the long head of the biceps. Tenderness over the biceps tendon should be found in the bicipital groove of the humerus with which may be associated *in this location swelling and soft crepitus* when the biceps is used detected either by the finger or the stethoscope

Internal rotation The important muscles producing this are the pectoralis major and the subscapularis The pectoralis major is accessible to palpation throughout its course and pain in internal rotation combined with local tenderness in the pectoralis major would establish injury of that muscle Pain in internal rotation when there is no local tenderness in the pectoralis cannot, however be assumed as certainly establishing injury to the subscapularis muscle because the latter is so closely associated with the anterior part of the capsule of the joint and the bursa which separates it from the base of the coracoid process that a resisted attempt at internal rotation might result in pain not only from the involvement of the subscapularis but also from injury to or inflammation of the capsule in that region If local tenderness to palpation is not present in the pectoralis major muscle and internal rotation is painful it may be assumed that the injury is to the subscapularis tendon or the anterior capsule of the joint or to both.

External rotation External rotation is produced by the infraspinatus aided by the teres minor The infraspinatus is one of the most important protections to the joint, supporting it from behind but is not commonly affected by muscle strain It would *be detected along the same lines indicated*

What has been said about muscular strain applies equally well to the strain of their tendons and in the latter case it may be possible to detect the crepitus of tenosynovitis

Synovitis Proceeding in the matter of the differential diagnosis of shoulder joint injuries, we come next to the condition of acute synovitis, which occurs here as in the other *joints but is less frequent in a typical form* than in the knee for example for the reason that the capsule plays so small a part in the support of the arm and limitation of arm movements and so large a part is taken by muscles For this reason muscular injuries in the shoulder joint are more prominent than elsewhere, and purely synovial injuries *less frequent*

In acute synovitis or arthritis or involvement of the shoulder joint in arthritis deformans, rotations are the first movements to be limited followed closely by abduction. Pain on pressure is usually acute over the most superficial part of the joint below and outside of the coracoid where the synovial membrane is most accessible and there is some sense of deep swelling In this condition also in its later stages pain is frequently found referred to the insertion of the deltoid muscle If acute symptoms continue it passes into a subacute condition, which may be described as arthritis or periarthritis in which the symptoms as described as characteristic of the acute stage persist.

Rupture of the supraspinatus insertion After a fall and sometimes after severe exertion, as in golf symptoms are felt in the shoulder joint consisting of a severe reaction in the joint associated with inability to abduct the arm and tenderness over the tip of the shoulder Attempts to raise the arm from the side are excessively painful and felt in the shoulder and if the condition is not recognized and remedied the disability in the shoulder still goes on but diminishes until all that remains of it is an irritable arm with inability to abduct without discomfort and a dragging sensation frequently referred later to the outer side of the arm Two types of this injury may occur In the first the *supraspinatus tendon may be ruptured* in part or wholly in which case the diagnosis is not always clear but more frequently it pulls off a piece of bone from its insertion which is perfectly evident in the X ray by the appearance of a detached piece of bone and the cavity in the bone made by its detachment can generally be detected This injury was particularly emphasized by Codman, who frequently found the tendon *frayed out in dissecting room subjects* and in operation on the subacromial bursa. The relation of the tendon and the bursa is so

intimate that a partial rupture of it would be very likely to be associated with reaction in the bursa

Bursitis Up to this time nothing has been said of the involvement of the bursæ of the shoulder joint which are numerous and important One or two of them communicate directly with the shoulder joint and must obviously be involved in any inflammation of that joint

The subdeltoid bursa is in close contact with the structures of the joint and our attention must next be directed to that The diagnosis of subdeltoid bursitis is so frequently made that it seemed worth while to go over the whole literature of the subject with a view to seeing what symptoms were described as characteristic to that particular injury, because in my own experience I saw so many cases diagnosed as subdeltoid bursitis that really on investigation and in their subsequent history seemed to be clearly lesions of the character described above and not bursitis at all It was impossible to find in this very extensive literature any symptoms essentially diagnostic of this condition, except in those cases where loose bodies were felt in the bursa or where the X ray showed either calcification in it, or a dense cloud in the soft parts limited to the region of the bursa, sometimes seen in an X ray taken with a soft tube

There is no question whatever that this bursa is from time to time injured and inflamed but in certain of those cases the involvement of the bursa may be secondary to joint involvement Tenderness over the bursa and the fact that limitation of abduction was partial in bursitis and total in arthritis were dwelt on as characteristic but it is obvious that either or both of these may exist in the conditions described above The sign described by Dawbarn where tenderness over the bursa exists but disappears when the arm is abducted and the bursa slides under the acromion may be of use, but as the arm is very early fixed at the side, abduction is impossible It needs only a glance at the anatomy to see that this bursa must share in extensive inflammations of the joint, and in injuries and inflammation of the tendons of the supraspinatus and infraspinatus and subscapularis

This diagnosis is an important one because on it may depend the question of operative interference which obviously should not be undertaken without very definite signs of the existence of the condition and undertaken then only with a very definite idea of what is to be accomplished by operation

TREATMENT

The treatment of injuries of the shoulder joint has almost defined itself by what has been said in speaking of the anatomy and mechanics of the joint There are two essential requirements

1 The arm should be abducted from the side and held there in order to take off the weight from the capsule and supporting muscles, and to relieve pain

2 The abducted position is necessary to counteract the pull of the two strong muscles —the pectoralis major and the latissimus dorsi, which if not antagonized will become adaptively shortened, hold the arm to the side and promote the occurrence of adhesions in the adducted position and these adhesions are a real menace as they may occur in the capsule, periarticular tendons and bursæ.

The use of a sling is unsatisfactory treatment and is responsible for a good deal of the after trouble that we have in treating these cases It takes off part of the weight of the arm from the supporting structures but favors the occurrence of adhesions in the adducted position and adaptive muscular shortening It is of course, perfectly good treatment to use a sling in the treatment of very light cases which are doing well, but as soon as any limitation of abduction appears or if it is originally present to continue the use of a sling is to bid for trouble The use of a platform splint, unsightly and conspicuous as it is is the only efficient treatment for moderate and serious injuries of this type in the shoulder joint. The splint may be made of wire, plaster of Paris, or any other material, it should hold the arm at a right angle to the long axis of the body, and the elbow should be if possible in the frontal plane In very acute cases, however, it will be impossible

to put the elbow as far back as this at first, and a position in front of this will then be preferable The elbow should be flexed at a right angle and theoretically the forearm should be vertical as internal rotation as well as adduction should be antagonized But in the majority of cases, perfectly satisfactory results are obtained if the forearm is horizontal This splint is not worn at night except in very severe cases and if it is to be worn at night plaster of Paris would be better than the wire Light massage and measures to stimulate the circulation are apparently useful as soon as the acute stage is over followed by active exercises for the abductors, external rotators, and scapular muscles, but early massage often excites a reaction, while electric light baking of the shoulder can be generally tolerated and improves the circulation

No common injury that we meet except possibly injuries to the spine, is so badly treated as injuries of the shoulder joint, and one relief that these patients receive from operations on the bursa is perhaps because following these the arm is fixed in an abducted position

Adhesions The majority of cases, when they consult the surgeon have already acquired adhesions in the adducted and inwardly rotated position, the arm is exceedingly painful and intolerant of manipulation, and unless something is done there is no prospect of immediate improvement As under these conditions massage is not tolerated and nagging passive movements are irritating, the best course to pursue, in cases where practically no abduction is allowed is to fix and support the arm in a position as much away from the side as possible without discomfort, by the use of a sling for support and a pad between the elbow and the body to secure abduction the size of which pad should be gradually increased.

It will be found in nearly all cases that the patient or someone connected with him is trying to stretch the arm and keeping it constantly irritated The use of fixation under these conditions will result even in the worst cases in quieting the symptoms, after which the real treatment may be undertaken by gentle passive stretching given without anaesthesia, at first every second day by the surgeon. Small gains may be obtained which are held by increasing the abduction of the arm A platform splint may then be put on which will maintain only a few degrees of abduction and this angle of abduction should be from time to time increased but it is never wise to increase it to the point of irritating the joint and the level of the arm should always be a little short of the maximum obtainable As the irritability quiets down more and more force may be used in the manipulation, and the angle of the splint increased but it must rest entirely with the judgment of the surgeon in his manipulations not to use enough force to excite a reaction which does not quiet down within 48 hours. Much reaction would mean an increased danger of adhesions, and every second day is at first often enough Light adhesions will be felt to rupture during such manipulation from time to time In addition to manipulation in abduction external rotation must be restored and the arm must be brought back until the elbow is in the frontal plane of the body After each treatment the arm should be put back on the abduction splint and massage continued The process is a very slow one and continues for weeks in bad cases.

If progress is checked by coming up against an obstacle that cannot be overcome by the use of moderate force or if it is impossible to give the time to the treatment manipulation under anaesthesia becomes advisable but *not* during the acute stage After the symptoms have quieted down sufficiently to warrant it, the patient is anaesthetized fully and unless severe resistance is encountered the arm should be put through its full range of movement in abduction and outward rotation and the manipulation should finish with the hand behind the head and fixed in this position until the patient is well out of anaesthesia This position is obtained by Brickner by tying the wrist to the top of the bed the head of which is raised by blocks. The patient should begin at once to move the arm voluntarily even if painful, as it restores his confidence and is much safer than passive

motions If a very severe resistance is encountered in manipulation, it should be abandoned for the time being the arm fixed in as much abduction and outward rotation as possible, and the remainder of the process conducted by manipulation by stages under anæsthesia, gaining what may be safe each time, fixing the arm in the best obtainable position and when full correction has been obtained, active movements, even if painful should be gone through by the patient, but passive movements are to be avoided when painful

Operative treatment There are two conditions requiring operation in connection with injuries of the shoulder joint. If the supraspinatus muscle has been torn away, carrying with it a piece of bone, the arm should be placed in an abduction splint and an X ray taken with the arm fully abducted If the X ray shows the fragment of bone in place the treatment should be continued in this position until time has been given for the fragment to unite If it is not then in satisfactory position, it is advisable that an operation should be performed The operation of choice is the one described by Robert Jones An incision like the cut of a sabre is made straight across the shoulder through the acromioclavicular articulation which is divided, and continues posteriorly below the spine of the scapula at the origin of the acromion process. A gigli saw is passed beneath the root of the acromion and the process divided from the spine of the scapula. The deltoid is now turned outward and downward giving complete exposure of the floor of the bursa, and the fragment is fixed in its proper position by a pin The acromioclavicular joint is sutured and the acromion falls back into place where it has been separated, and the arm is immobilized in abduction, and there is little likelihood of displacement.

The other condition demanding operation is that in which a chronic bursitis of the subdeltoid bursa has been clearly established, which has not yielded to the measures described in speaking of the treatment of shoulder joint injuries, or where the calcification of the walls of the bursa is clearly demonstrated In this case the bursa is opened by an incision through the deltoid muscle exposing the roof of the sac If this is opened the floor of the bursa is exposed and the tendons of the short rotators are seen just below the floor Adhesions are broken up, villous masses removed, and calcareous deposits identified and scraped away or dissected out If there is reason to suspect an injury to the tendon of the supraspinatus, its sheath should be incised in its length and the tendon repaired The dissection out of the whole bursa is impossible as it is attached to the tuberosity of the humerus and to the acromion above, and routine attempts to dissect out the bursa in slight cases should be discouraged

Irritable arm—false neuritis Any consideration of injuries to the shoulder joint would be incomplete without mentioning one very troublesome condition which must be constantly seen by all surgeons, and which has not, apparently received much attention, which may best perhaps be spoken of as a painful or irritable arm, and is exceedingly common in practice In certain patients, particularly nervous and overworked women symptoms wholly out of proportion to the cause follow slight injury and overuse to the shoulder joint, or may appear without known cause The injuries are more often slight strains or excessive use of the muscles in persons with poorly developed shoulder muscles and in the cases seen, atrophy of the shoulder muscles has been a universal accompaniment, often reaching a high degree, and would seem to be the important factor in causing pain Soon after the injury or over use an extremely painful condition involving the whole arm arises and the diagnosis of neuritis is almost always made, although legitimate symptoms of neuritis are absent There is no disturbance of sensation, no tenderness over the nerve trunks, and no swelling of the hand The arm feels heavy and aches after use, particularly some time after use, and wearing a heavy coat or carrying a bag on the affected side gives rise to great discomfort. There is tenderness to pressure at the root of the neck, and on the affected side the arm is carried at the side very often in a sling and is exceedingly

irritable As a result of this position the motion of abduction becomes limited from adaptive muscular shortening of the pectoralis and latissimus muscles and perhaps later by adhesions and abduction even passively performed becomes limited and painful Massage except of the gentlest grade is irritating and as there is generally later some limitation of abduction by attempted use the joint is continually irritated

The condition apparently goes on indefinitely It would hardly be fair to say that it is always associated with neurasthenia, but the patients appear to have a well-organized nervous system and to be as a rule in poor general condition The diagnosis of neuritis is accepted by the patient as explaining *everything*

The treatment that has been most successful has been to use a sling to take off weight, to give the gentlest possible massage to improve the circulation and muscular tone along with the use of radiant heat, and to begin as soon as possible exercises to develop certain shoulder joint muscles. The biceps and triceps for example can be exercised without moving the joint. The severest cases will require the use of an abduction splint and if adhesions are present they must be stretched by passive manipulation in abduction when acute irritability begins to diminish and then active developmental muscular exercises must be begun and continued

The attempt has been made in to call attention to certain perf known anatomical and mechanical which apparently dominate the the injured shoulder We are t forget the weight of the arm inevitable muscular drag which when the muscles lose their proper all muscles of an injured joint must early stage. As a result of this pain and irritability we have the dragging pain especially notable insertion of the deltoid, the chief from this weight. Neither must we the exceedingly complex nature of and the intimate relation of bursæ to capsule Injury of one *alone must be rare, for the contact* ent structures is too close to pre most cases

The moral that I would point we should regard the shoulder whole when we treat its injuries, allow ourselves to find the exp symptoms in the assumption of t mation of one bursa, an frequently exists, but which does quately in many instances ex symptoms present. And finally plead for the primary fundamental ments of fixation in abduction from stage

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THE DIAGNOSIS AND TREATMENT OF TUBERCULOUS EMPYEMA

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TUBERCULOUS empyema may be defined as a type of suppurating pleurisy in which the tuberculosis bacillus is either the sole infective organism or is one of the organisms of a mixed infection. Dry adhesive pleuritis, pleurisy with serous effusion and suppurative or hæmorrhagic pleurisy constitute different grades of reaction to pleural infection The extent of the pleural reaction is in proportion to the virulence of the infection and the resistance to it

From a pathological point of view, tuberculous pleurisy may be subdivided into primary and secondary forms To the first belong the cases of initial involvement of the pleura, to the second cases following lesions of the lungs chest wall or glands Some writers consider all cases of tuberculous pleurisy secondary to pulmonary involvement. Cases occur however, in which there is no demonstrable focus in the lung In such instances the lung tissue possibly furnishes only the avenue of infection

Primary tuberculous pleurisy with or without effusion, which has its analogue in primary tuberculous peritonitis probably occurs more frequently than is generally recognized Hodenpyl found nodules and patches on the visceral pleura in 44 of 91 cases in which the lungs were free from tuberculosis These nodules were proved to be tuberculous by microscopic examination in 41 cases, and in 3 without nodules foci of tuberculosis were demonstrated microscopically Hodenpyl regards this type of involvement as the most likely to heal spontaneously To the same group belongs probably a large proportion of the cases of primary adhesive pleuritis and pleurisy with effusion The analogy to tuberculous peritonitis of the dry plastic and ascitic types is striking

The question of the etiology of primary or idiopathic pleurisy with effusion is of especial importance in the consideration of tuberculous empyema. Although Cabot Rist, and Webb expressed doubt with regard to the tuberculous nature of the primary serous effusions observed in the American Expeditionary Forces, there is much evidence to substantiate the view commonly accepted that save for an occasional instance of effusion complicating unrecognized pneumonia these are tuberculous in nature This evidence is furnished by the investigation of the further history of cases of pleurisy with effusion, and by a study of the fluid Series of patients whose course is followed for from 5 to 20 years show that from 35 per cent to 55 per cent eventually die of tuberculosis (Osler Hedges, Sears, and others) Insurance companies find that deaths from tuberculosis among persons having had pleurisy with effusion is three times the average (Norris and Landis) Of special interest is a series of Koester who found that of 514 patients 245 became tuberculous About 50 per cent of the patients had active lesions before the end of 5 years but a latent period of 10 years or more was noted in about 7 per cent of 164 cases

The demonstration of tuberculosis bacilli in the serous exudate constitutes the most convincing evidence of its tuberculous nature Direct examination of the sediment obtained by centrifugalising the digested clot the so-called inoscopy of Jousset, and animal inoculation have yielded positive results in from 20 to 85 per cent of the cases The widely divergent results are probably due to differences in technique, and in the animal inoculations to the varying virulence of the bacilli By inoscopy positive results were obtained in 20.8 per cent in a series of 115 cases at the Massachusetts General Hospital (Goodall), in 65 per cent by Zebrowski In 45.4 per cent in a series of 51 cases reported by Musgrave and in 100 per cent in 20 cases reported by Jousset. Animal inoculation yielded only 33 per cent positive results in Musgrave's series, but Dauniy, using 300 cubic centimeters of exudate in divided doses of 10 cubic centimeters each obtained positive

results in 48 of 50 cases Spengler states that he has always been able to demonstrate tuberculosis bacilli by using 200 cubic centimeters of exudate aspirated from the lowest portion of the pleural cavity Musgrave demonstrated the bacilli by inoscopy in 8 case in which the guinea pig test was negative The varying virulence of the bacilli is indicated by the fact that he obtained negative results in three animals injected with three successive tappings but 6 months later obtained a positive result Barjome and Cade also found that only one of three or four animals gave a positive test These experiences emphasize the uncertain significance of a single injection of a few cubic centimeters of fluid in one animal

Musgrave regards a positive tuberculin test and a relatively large percentage of lymphocytes in the exudate as of diagnostic value

A serous effusion may persist for months without tapping (Fyfe) or it may promptly subside after one or two aspirations Patients should not be repeatedly tapped however If the effusion persists it may remain serous or as often happens especially after frequent tapping it may become purulent Very little seems to be known regarding the conditions which govern these changes Floyd concludes from an experimental study injection of dead and living pyogenic bacteria into the pleural cavity that the varying reactions depend on the relative virulence of the organism, and that when there is but little chemotaxis pleurisy with or without effusion results, but that if the chemotactic action is profound and the elaborated toxin not too destructive, empyema results. Opie on the other hand using graded amounts of turpentine as the pleural irritant, which produces effusion found an increased tendency to purulent change following aspiration of the fluid He believes that this difference may be due to an increased activity of the leucoprotease of the polynuclear leucocyte normally held in check by the anti-enzyme of the exuded serum.

In contrast to the cases of primary idiopathic pleurisy are pleurisy in the lung chest wall or glands. The common pneumonic pleurisy with or without effusion is an analogous condition. Lord found a serous effusion in 5 2 per cent of 1185 cases of pneumonia, and Musser reports 5 serous and 20 purulent effusions in 127 necropsies following pneumonia. In the recent epidemic of streptococcus infection pleural effusion was the rule

Tuberculous infection of the pleura is a common concomitant of pulmonary tuberculosis Osler writes that the visceral pleura is always involved. The frequent resultant partial obliteration of the pleural cavity may account for the fact that a relatively large proportion of cases do not develop late effusion In the absence of obliterating adhesions the pleural cavity may become grossly infected by the rupture of a subpleural focus producing a spontaneous pneumothorax. This occurs in from 4 to 10 per cent of institutional cases of tuberculosis (Gutmann, Eichorst Cruice) The presence of apical pleurisy should be considered as a benignant process of conservation. This complication is usually announced by marked symptoms A mixed infection usually results, which makes the prognosis grave Spontaneous pneumothorax however may have an insidious onset, and not give rise to marked symptoms. Such cases are of the latent, mute type of pneumothorax which are most liable to develop a purulent effusion (Bouchut and Gravier) Baeumler reports two cases in which the exudate remained serous in the presence of pneumothorax

Tearing the lung by band like adhesions occurs as a complication of the pneumothorax treatment of pulmonary tuberculosis (Cocke, Marshak and Craighead Webb, and others) Duboff reports 10 cases of effusion in 48 of which artificial pneumothorax had been used Spengler states that an effusion resulted in 50 per cent of 100 such cases He believes that the exudation is due to loosening up of pleural adhesions

The bacteriology of undrained tuberculous empyema has been less well studied than has that of tuberculous pleurisy Netter (59) in a series of 109 cases of purulent pleurisies, found tuberculosis in 15 2 per cent, but in 13



Fig 1 Case 185290. Chronic tuberculous empyema of about 3½ years duration with almost complete collapse of the lung September 19 1919.



Fig. 2 Case 185290 Chest shown in Figure 1 following a Wilms three-stage plastic operation Complete obliteration of the cavity April 7 1920.

cases diagnosed tuberculous empyema he found the bacilli in only 5 (Sokottowski) In 6 cases there was no growth. He regarded the cases which were sterile to culture as tuberculous Ehrlich found tuberculosis in 7 of 19 cases of empyema, Fraenkel found it in 1 of 12 cases, and Renvers in 2 of 15 cases. Netter writes that one always should obtain positive results in tuberculous empyema either by guinea pig inoculation or by direct examination Staphylococcus in pure culture is uncommon, but when present is suggestive of tuberculosis (Netter, Sokottowski) A sterile purulent effusion is tuberculous in the majority of cases (Sokottowski)

In chronic draining empyemata bacteriological study is of little value Beck (6) reports staphylococci in practically all cases and streptococci in 10 per cent. Gordon, in an intensive study of 25 chronic cases concludes that the primary organism, notably streptococcus, disappears, and that there may be a succession of secondary invaders It seems evident, however, that, although a mixed infection always occurs in these drained cases the tuberculous infection persists Beck (3) states that tuberculosis is rarely found in secretions even in cases in which the empyema is positively of tuberculous origin, but that the bacilli may be demonstrated in numbers in the exudate after treatment with bismuth paste which he believes stimulates leucocytosis, the leucocytes carrying the bacilli out in the discharge Heuer refers to a case in which bismuth paste was used after which the exudate teemed with bacilli

DIAGNOSIS

Positive proof of the tuberculous nature of a purulent exudate is afforded by finding the bacilli in the exudate by direct examination, by animal inoculation, or by a demonstration of the characteristic microscopic picture in the excised pleura Unfortunately the demonstration of the bacilli in the exudate is usually difficult, and the animal inoculation

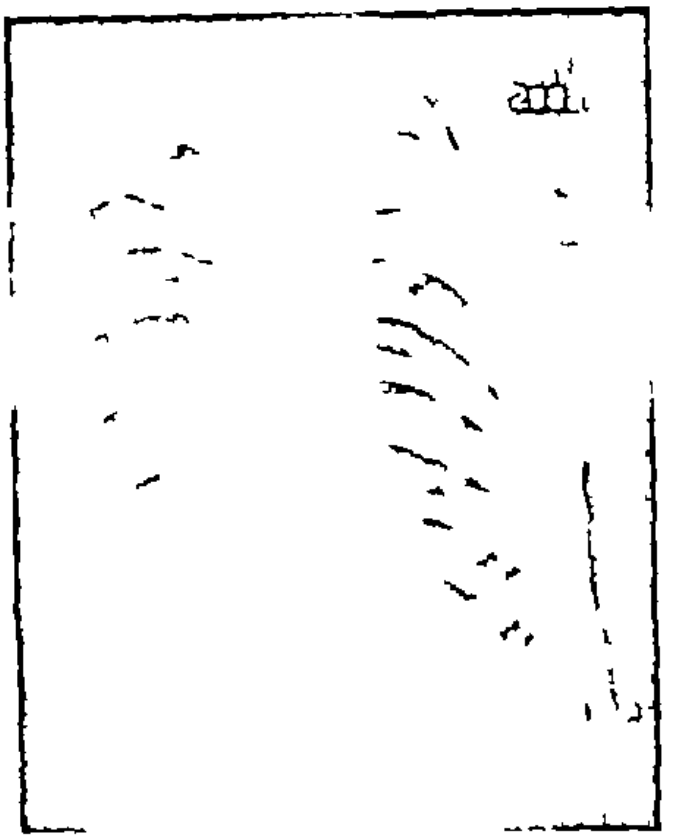


Fig [illegible] Case 28385 Chronic empyema cavity of six [illegible] duration



Fig 4 Case 341738 Chronic tuberculous empyema cavity of two years duration

to t results in many failures and requires at be t 6 weeks of time The examination of pleural tissue is a postoperative procedure In the ordinary case therefore a presumptive diagnosis must be made on the clinical history of the case the character of the exudate and the recognition of a tuberculous process in some other organ

History A family history of tuberculosis is of some value Cabot showed that in a series at the Massachusetts General Hospital of 300 patients with pleurisy 6, per cent who later developed tuberculosis had a positive family history while only 25 per cent of those who remained well had such a history An insidious onset without preceding infectious disease especially if accompanied with fever night sweats, loss of weight and strength loss of appetite and progressively increasing nervousness is always suggestive of tuberculous infection The cases with insidious onset in apparently healthy or but persons are among the most difficult to recognize A history of preceding pleurisy with effusion even though years before affords grounds for suspicion that a later idiopathic" empyema may be tuberculous A history of pleurisy with serous effusion in an adult should be evaluated equally with that of an hæmoptysis (Lemon)

Character of exudate In cases without drainage sterile purulent fluid, especially in the presence of fever and with a low leucocyte count is almost certain to be tuberculous Staphylococcus infection ordinarily rare in undrained empyema has been found associated with tuberculosis A pyogenic organism, notably pneumococcus, may die but an effusion giving a negative culture and smear may be considered tuberculous.

The presence in other organs of a tuberculous lesion notably pulmonary phthisis and tuberculous peritonitis, lends weight to a presumptive diagnosis of the tuberculous nature of co-existing empyema. A healed or quiescent pulmonary process such as is often seen in the roentgenogram is probably taken by itself of relatively little significance but an

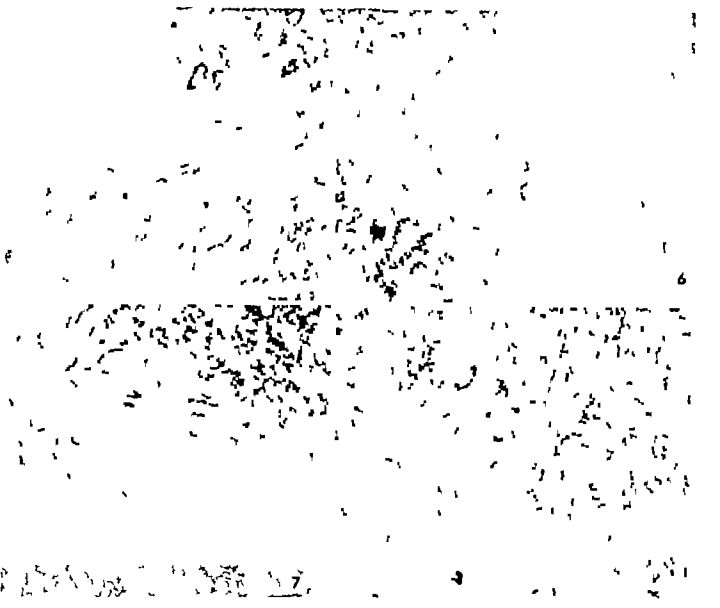


Fig. 5 Case 47717 Typical tubercles and foreign body giant cells associated with marked lymphocytic infiltration in a tuberculous area in the parietal pleura.

Fig 6 Case 185290 Ill defined tubercles and foreign-body giant cells associated with marked lymphocytic infiltration in a tuberculous area in the parietal pleura

Fig 7 Case 362614 Few foreign body giant cells associated with marked necrosis, lymphocytic infiltration, and fibrosis in a tuberculous area in the parietal pleura.

Fig 8 Case 289416 Ill defined tubercles and foreign-body giant cells in an area of tuberculous granulation tissue of the parietal pleura.

active process giving rise to characteristic râles, and especially positive sputum examination, leaves little room for doubt with regard to the tuberculous nature of an idiopathic purulent effusion Effusion complicating artificial pneumothorax therapy or following spontaneous pneumothorax in advanced cases is probably tuberculous, even in the presence of pyogenic organisms, which in such cases contribute to a mixed infection. Faguoli reports serous effusion in 10 of 23 cases in which pneumothorax therapy was used.

MAYO CLINIC SERIES

The records of the Mayo Clinic since 1910 contain histories of 23 cases proved by bacteriological or pathological examination to be tuberculous empyema These cases are included in Group 1 Fifty-one cases not so proved in which a tuberculous lesion elsewhere, or other clinical features, make for at least a probable diagnosis of tuberculous empyema, have been classified into Groups 2 3, and 4

Group 1 In the 23 patients in this group the diagnosis was made or was confirmed by

examination of excised pleural tissue in 18 Guinea-pig inoculation of the exudate was positive in one in the purulent stage and was positive in one in the serous stage necropsy in the latter case showed pyopneumothorax and tuberculosis of the lungs liver and retroperitoneal glands Tuberculosis bacilli were found in smears of the purulent exudate in 3 Five patients had well marked tuberculous lesions associated with Pott s disease of the spine and multiple cold abscesses in one tuberculous glands proved microscopically in one and in one necropsy showed, besides a large pulmonary cavitation, tuberculosis of the kidneys and multiple tuberculous ulcers of the intestines, from the perforation of one of which the patient had died In the fourth the onset was that of a typical pleurisy with effusion and in the fifth the sputum contained tuberculosis bacilli

Group 2 In this group were 16 patients with clinically tuberculous empyema. Further evidence substantiated the presence of tuberculosis In one patient (Case 51816) besides a history of pleurisy with effusion, chronic cough with sputum and a diagnosis at operation, cold abscesses developed later in the chest wall In 2 (Cases 137779 and 260196) characteristic lesions were found at necropsy and in one besides cough sputum, and physical signs of phthisis, hæmoptysis developed In the remaining 12 various combinations of positive findings as to family history past history of pleurisy cough with sputum, physical and roentgen-ray findings the gross appearance at operation and the further course leave little question of the presence of tuberculosis

Group 3 There were 22 patients with empyema associated with pulmonary tuberculosis in this group Roentgen ray showed the pulmonary lesion in all In 3 there was an active process at the time of the first examination, and in 4 later examinations showed active progressive lesions The bacilli were found in the sputum in 4 with active pulmonary foci, and in 1 without such foci There was a positive family history in 2 in both the lesions were active A history of pleurisy or cold' preceding the empyema was noted in 6 and a past history of pleurisy was noted in 9 in 3 of which the immediate preceding illness was not characterized by pleurisy The onset of the empyema was insidious in 3 and sudden in 14 The onset was preceded by pneumonia in 10 There were various combinations of cough with sputum and fever in 16 and there were râles or bronchial breathing or both, in 6 in 2 of which there was no cough nor sputum

Group 4 The patients in this group had empyema following idiopathic pleurisy with effusion They gave histories of previous attacks which occurred within a year before the onset of the empyema in 5 in 3 it occurred 2 3 and 9 years before respectively The time was not stated in 4 Cough and sputum were present in 7 of the 13 patients. The sputum was examined for bacilli in 5 but none was found Reports of the end results concerning 8 of these patients have been received Three died. One had a large pneumothorax, and one a persistent drainage and cough and sputum up to the time of death

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the tuberculous nature of the empyema was proved In 38 others the patient had a tuberculous infection, determined by pulmonary lesions, shown in the roentgenogram in 22 and by characteristic histories and symptoms in 16 in 7 of which the diagnosis of tuberculosis of the pleura was made at operation from

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of the 13 cases in Group 4, in which there was a history of pleurisy with effusion, are probabl

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monary lesion is one that cannot be answered categorically Some writers are of the opinion that they are all cases of tuberculous empyema. The almost constant association of pleuritis, even with early localized pulmonary lesions, is a matter of common observation. It seems obvious that inasmuch as patients with tuberculosis of the lungs develop secondary pyogenic lesions, pneumonia, ab-

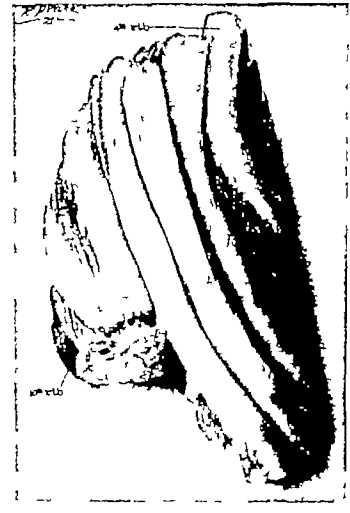


Fig 9. Case 185290. Overriding and fusion of the ribs in tuberculous empyema of 22 years' duration.



Fig 10 Case 185290 Visceral aspect of specimen shown in Figure 9 Note thickness of parietal pleura.

scess, and so forth, they may also develop secondary pyogenic pleurisy The difficulty of proving such cases to be tuberculous empyemata is analagous to the difficulty of establishing positive proof of incipient phthisis Walton suggests that a distinction should be made between tuberculosis of the pleura a secondary tuberculosis in a patient with chronic suppurating pleurisy, and suppurating pleurisy in a patient with tuberculosis From a review of the literature it seems evident that the tuberculous nature of a large proportion of empyemata has remained unrecognized (Table I)

TABLE I—RELATIVE INCIDENCE OF TUBERCULOUS EMPYEMATA REPORTED

Author	Cases	Diagnosis of tuberculous	Per cent age
Martin	21	3	14 3
Bergeat	21	4	19 0
Bythell	40	10	25 0
Wilensky	83	13	15 8
Moutard Martin	84	7	8 3
Dunlop	98	3	3 0
Grieg	100	0	0 0
Netter (60)	109	12	11 0
Hirano	118	3	2 5
Voswinckel	129	14	10 0
Nathan	145	10	6 8
Holsti	166	13	7 8
Schede (68)	484	45	9 3
Hedblom	366	61	17 0

A more careful study of cases of chronic empyema in general, of cases in which there is a tuberculous focus, and of cases in which there is a history of a primary pleurisy with effusion, will undoubtedly prove a considerably larger proportion to be tuberculous

TREATMENT

In the treatment of tuberculous effusion account must be taken of its varied pathology and of the patient's condition. A distinction

GROUP I — TUBERCULOUS EMPYEMA

Case	Age and sex	Pleurisy	Illness at onset	Onset and duration of symptoms	Cough	Bacteriological tests in sputum	Rales	Roentgen ray findings	Previous operations	Days in hospital before operation	Operations	Pathological diagnosis	Remarks
37 7	M 5	0	Influenza	5				Fluid	7 aspirations	0	8 19 Plastic resection of bony ribs after Dakin solution treatment 5 2-17 Skin plastic	4- 9 Tuberculosis of parietal pleura	20 Complete healing
5 10032	M 28	+	Pleurisy	8	+	+		Rich tuberculous thickened pleura left effusion	6-20 Drainage		20 Drainage mixed tuberculous infection		9 14 Death Empyema never healed, patient had pulmonary tuberculosis
9818-14	M 38	+	Pleurisy	9	+			Retraction	5 aspirations, rib resection	+	2-17 14 Partial thoracoplasty 10 6 5 Thoracoplasty 6 29- 7 Aspiration psoas abscess	6 7 6 Tuberculosis of parietal pleura	9 9 Death from malignancy, no necropsy Multiple "cold" abscesses, Pott's disease
107 804	— 26	0	Pneumonia		+	+		Old tuberculous, bronchial thickening	9 13 Aspiration tuberculous glands		8 11 7 Drainage		8-17 Death from septicemia no necropsy
007	M 36	0	Abscess	5	+			Right empyema, thickened and retracted pleura	7- 3 Rib resection	0	7 29 Drainage 4 24- 5 Multiple rib resections 7 8- 3 Minor thoracoplasties	7 5 Tuberculosis of parietal pleura	9 17 Last report good health slight drainage
11478	F 8	0	Pneumonia	8	+	+	+	Fluid thickened pleura	3 aspirations	0	8 4-14 Rib resection for drainage 9 4-17 3 Increase for drainage 8 20-19 Exploration, no cavity found	4 7 5 Tuberculosis of parietal pleura	8 Wound still draining
8 66	M 30	+	Pleurisy	5	+	+		Left empyema thickened pleura	9-13 Rib resection	0	9 29 14 Drainage 8-6 3 Thoracoplasty operation 7- 5 Rib fragment removed	8- 7 3 Tuberculosis of parietal pleura	6-16 Wound almost healed good health
1 90 190	F 8	0	0	1	+			Empyema, thickened pleura, lung retracted	10 14 Aspiration rib resection	+	6-9-16 Rib resection for drainage	3 30-16 Tuberculosis of parietal pleura 6 7 6 Tuberculosis of parietal pleura	8-17 Wound healed no trouble since
1 401 26	M 40	+	Pleurisy empyema	1	+	+	+	Fluid left lung collapsed tuberculous right	9 14 aspirations	+	7-16 Rib resection for drainage	4-16 Tuberculous bacilli in pleural exudate	7-16 Death
18 8 11	M 44	0	Typhoid, pneumonia	8	0	+		Right empyema, Large pocket	3 rib resections	0	6 30 6 Exploration after Dakin's solution treatment 8-9-19 Sclerosis	8-9-19 Tuberculosis of parietal pleura	9 9 Death, lung abscess, bronchial fistula, tuberculous empyema, tuberculous meningitis No necropsy
83 900	M 38	+	Pleurisy	9	0	0	+	Upper left tuberculosis, fluid	3-16 Drainage	+	8-1 9 Exploration and curettage preliminary Dakin's solution treatment 3 6-20 Widens first stage, after Dakin solution treatment 3- 3 20 Widens second stage 20-20 Widens third stage	4 2-17 Tuberculosis by guinea-pig inoculation 8-13- 9 Tuberculosis of parietal pleura	3 Good health slight drainage

217207	M 53	O	Cold	I	+		+	Tuberculous both spaces, fluid	Aspiration	+	12-24 17 Rib resection for drainage	12-17 Tuberculosis of parietal pleura	12-27-17 Death Necropsy perforation tuberculous ulcer of ileum multiple tuberculous foci
230390	M 22	O	Cold	S	+	+		Fluid heart enlarged		O	9 aspirations 6- 9-18 Rib resection for drainage, septic pyopneumothorax	6-24 18 Tuberculous by guinea pig inoculation	6-28-18 Death Necropsy; tuberculous both lungs, liver retroperitoneal glands
237743	M 22	O	Chill?		O		+	Lung retracted right pneumothorax; fluid	8- 7 Aspiration; drainage	O	9-12-18 Decortication after Dakin's solution treatment. 9-19 9 Rib resections for drainage Patient refused extensive plastic	9-24 19 Tuberculosis of parietal pleura	4-21 Wound still draining; treatment incomplete
260767	M 32	?	Lung abscess	I	+			Infiltration left lung	1913 Abscess left axilla	O	2-27-19 Exploration 3-6-19 Negative aspiration. 3-30-19 Negative aspiration 7 7 19 Rib resection for drainage	7 17 9 Tuberculosis of parietal pleura	Much improvement when last seen Developed pulmonary tuberculosis, apparently as secondary complications
262624	F 27	+	Pleurisy; childbirth	I	+			Fluid	8 aspirations rib resection	O	3-25-19 Decortication, after Dakin's solution treatment. 3- Rib resection and skin muscle plastic (bronchial fistula)	3-25 9 Tuberculosis of parietal pleura 3 7 Tuberculosis of parietal pleura	4 21 Wound practically healed
26300	F 21	+	Pleurisy; childbirth	I			+	Lung collapsed, probably fluid	4 aspirations, 12-18 drainage	O	3 27-19 Decortication, at tempted 11 19 Rib resection for drainage	12-19 Tuberculous ernest and pleura	12-19 Death from hemorrhage
262370	M 27	+	Pleurisy	S	+	+		Probable empyema, left, tuberculous interlobar pleurisy right lung	6-18 drainage	O	3-18-19 Exploration after Dakin's solution treatment 3 27 9 Rib resection and skin plastic	3-27 9 Tuberculosis of parietal pleura	5-20 Death
274687	M 54	+	Influenza	S	+			Pleural thickening probably fluid	2-19 Drainage	O	6-28- 9 Rib resection for drainage	6- 8-19 Tuberculosis of parietal pleura	9-20 Light drainage patient working
2804 8	M 54	+	?	I	+	+		Left empyema small pocket	000, 1 aspirations, 918 drainage	O	10-16-19 Decortication after Dakin's solution treatment 10-19-20 Rib resection and skin muscle plastic	10- 9-20 Tuberculosis of parietal pleura	4-21 Wound healing some pain
311166	M 29	+	Pleurisy influenza		+	O	+	Pleurisy	2-19 Rib resection 2-20 Drainage	O	9-14-20 Aspiration, preliminary Dakin's solution treatment 10-2-20 Rib resection and skin muscle plastic	10-4-20 Tuberculosis of parietal pleura	10- 0-20 Appendectomy gangrenous appendix 4 Patient in sanitarium drainage, both temperature, and so forth
333476	M 29	+	Influenza, pleurisy	I	O	+		Density abscess	8-19 Rib resection	O	10-14-20 Decortication after Dakin's solution treatment 2-0-20 Rib resection and skin plastic	2-9-20 Tuberculosis of parietal pleura	3- 1 Health good, wound healing slowly
340048	M 30	O	Influenza	I	+	+		Empyema lung collapsed fluid in right base	Aspiration, drainage wound re opened	O	12-2 20 Rib resection and skin muscle plastic	12- 20 Tuberculosis of parietal pleura	4 Narrow sinus, prognosis good

GROUP II — CLINICALLY TUBERCULOUS EMPYEMA

Case	Sex and age	Pleurisy	Illness previous to present	Onset sudden or insidious	Cough	Physical findings in chest—fever in sputum	Rales	Roentgenographic findings	Previous operations	Operations	Pathological diagnosis	Results
27150	M 11	0	"Cold"	I	+	+	+	Right empyema, tuberculosis of left lung	900 Aspirations	3-23-25 Rib resection for drainage		Patient left Ohio much improved. Death reported
31814	M 29	+	Pleurisy	S	+	+		Old pleurisy		4-19 Rib resection for drainage 11 Redrainage		Results unknown
31841	M 4	0	Pneumonia	S	+	+	+	Possibly fluid, tuberculosis both sides thickened pleura		2-28 14 Rib resection for drainage		Death nine weeks after discharge from Clinic
137779	M 49	0	"Cold"	I	+	+		Fluid, congestion	6-15 Hospital aspiration	8 7-13 Drainage empyema pneumothorax 8 6 3 Drainage 8 30- 3 Redrainage	8 21-23 Chronic inflammation of pleura	8-28 5 Death Necropsy empyema, lung abscess, perforation between bronchus and pleura
39774	F 22	0	Pneumonia	I			+	Thickened pleura	3 drainage operations	-28-16 Drainage	-28 16 Chronic inflammation of pleura	Intermittent drainage, patient's general health fair
55105	M 43	0		I				Calcified pleura		3 31 16 Drainage 10-20-16 Rib resections, radical cure calcification of pleura	3-31 16 Inflammation of pleura	9-17 Last report, draining
64311	F 37	+		S	+	+		Probable fluid	Aspiration	7-16 Three aspirations 7 31 6 Rib resection drainage 8-4 8 Explorations and redrainages		Last operation incomplete at patient's request 3-17 Wound decreasing in size but not healed
167981	M 22	0	"Cold"	I	+	+		Fluid	6-16 Aspiration	7 26 16 Rib resection for drainage	7-26-16 Lentulo negative	Death weeks after discharge from the Chest
180 98	M 5	+	Pneumonia	I				R t t d rale, thickened pleura	5 drainage operations	18 9 Rib resection skin plastic 3-18-19 skin plastic	3-18 9 Chronic inflammation of pleura	Wound completely healed, patient developed tuberculous meningitis Death 4 20
184318	M 41	+	Pleurisy	I	0			Effusion, operation left, tuberculosis both apices	3 drainage operations	4-3-19 Exploration and drainage		8-8 9 Death
18835 1	F 32	+		I				Fluid, ribs resected	drainage operations	9 16 9 Aspirations, Dakin's solution treatment 9-18-9 Exploration, drainage	9-18-19 Chronic inflammation of pleura	3-20 Sinus healed, good health since
190083	F 27	+		I	+	+	+	Old empyema, right, pleura thickened, tuberculosis right	9-17 Aspiration	10 14 9 Aspiration	9-14-10 Pleural exudate negative	Patient sent to sanatorium
208383	M 34	+	Pneumonia	S				Collapse left lung, pneumothorax right	Several aspirations, 500 drainage	2-11-19 Exploration, Dakin's solution treatment		Patient too sick for radical operation, result not known
209284	M 26	+	Pleurisy	S	0	0		Pneumothorax	Several aspirations, drainage operations	-15 20 Rib resections and skin plastic -9-20 Rib resection and skin plastic	-15-20 Chronic inflammation of pleura	7-1 Good health wound healing rapidly
200040	M 66			I	+	+		Fluid left, old empyema right, calcified tuberculous pleurisy left		2-24 9 Aspiration	2-19-19 Pleural exudate negative	3-21 Reaccumulation of fluid, further operation not advisable
208499	M 28	+	Pneumonia	S	+	+	+	Old empyema, right, large pocket	21 Aspiration, drainage	-17-20 Rib resections, drainage 3-9-20 Rib resection and skin plastic (bronchial fistula)	-17-20 Chronic inflammation of pleura	-1 Wound healed, patient working and in good health

must first be made between effusion in a closed pleural cavity and one in an open cavity The exudate in a closed cavity may be sterile or secondarily infected, that in an open cavity is always secondarily infected

Pleural effusion in a closed cavity A sterile effusion in a closed cavity may be serous, hæmorrhagic, or purulent. The presence of enough exudate to be clearly recognized clinically is usually considered as an indication for aspirating as much of the fluid as can be obtained Certainly enough fluid to produce symptoms of mechanical embarrassment to respiration and circulation is generally considered a clear indication for the aspiration of large amounts of fluid Evidence has been brought forward however, to show that a sterile exudate exerts a healing effect in a tuberculous process in the lung Koeniger reports 78 cases in which marked improvement occurred in all but 3 per cent, and the improvement seemed lasting in more than half Similar observations have been reported by Mongour, Schroeder, Kaufmann Muralt, and others Spengler and Sauerbruch point out that this does not seem to be due to the mechanical compression of the lung because the improvement observed is not in proportion to the amount of exudate and consequent compression of the lung They believe the result to be due to a biological process of great importance Koeniger attributes the improvement to a chemic process inducing auto-immunization

On a somewhat similar basis Gilbert proposed injecting some of the aspirated fluid subcutaneously Others have since advocated the treatment Fishberg reports 14 cases in 11 of which treatment was beneficial and Lyter reports 23 cases with favorable results in 8 When it is considered, however, that the exudate probably contains living tuberculosis bacilli, the rationale of such treatment seems questionable

From the foregoing it appears very doubtful if it is ever advisable to remove large amounts of fluid at one time Aside from a possible biological influence exerted by the fluid, its aspiration may exert an unfavorable influence on a co-existing incipient or active pulmonary lesion. Spengler states that miliary tuberculosis has been known to follow Clinical experience has also shown that, whereas aspirating a large amount of fluid seems to stimulate further exudation the aspiration of a relatively small amount results in an augmented rate of spontaneous absorption

In order to prevent re-expansion of a tuberculous lung whether by aspiration or rapid spontaneous absorption of the fluid nitrogen or filtered air may be injected to replace all or a part of the volume of the fluid removed Such treatment is especially indicated in case effusion follows artificial pneumothorax therapy

Patients with sterile purulent exudate are of the type most liable to become the victims of injudicious surgery This condition represents an exception to the rule *ubi pus ibi evacua* for the simple reason that there is no pus in the sense of the word used in this hackneyed phrase A sterile, purulent exudate presents essentially the same condition as a serous exudate, and should be treated on the same principles In many cases in which there are considerable amounts of purulent exudate in the pleural cavity, remarkably little evidence of its presence is shown Baeumler reports the case of a young girl who remained well nourished free from fever, and who worked regularly for 3 years although from 1000 to 1700 cubic centimeters of pus were aspirated at intervals. Such patients should not be aspirated indefinitely however but an extrapleural plastic operation should be performed Aside from the danger of a mixed infection, either introduced during repeated aspiration or a concurrent infection elsewhere metastasizing to the pleura, there is probably in most cases a marked and progressive thickening of the diseased pleura making the collapse of the cavity by an extrapleural plastic operation more difficult

A mixed tuberculous and pyogenic infection in a closed cavity, especially with marked sepsis, requires prompt drainage, either by the open or by the closed method, with antiseptic solution drainage Sterilization by the antiseptic irrigation of the closed cavity has the distinct advantage that the cavity may be considerably reduced in size, and a later

GROUP III — EMPYEMA ASSOCIATED WITH PULMONARY TUBERCULOSIS

Case	Age and sex	Pleurisy	Illness at onset	Onset sudden or insidious	Cough	Bacillus tuberculosis in sputum	Pain	Roentgen-ray findings	Previous operations	Operations	Pathological diagnosis	Results
491 6	M 11	0	Pneumonia	S	+	+		Tuberculosis?		6-2-16 Drainage		Empyema healed in 9 to 10 weeks chronic nephritis
47060	M 36	+			+			Tuberculous opposite side	Aspiration	6-30-1 R b c drainage		Wound had completely healed, patient's general condition much improved at last report Death, cause unknown
70099	F 30	+	Pleurisy	b		+	+	P b b l f d, thickened pleura, tuberculosis left lung	Aspirations negative	7-09 Rib resection for drainage	7 10 Pleural exudate negative	Sinus healed once, reopened during pregnancy 9 16 Last report any post condition
73093	M 9	0	"Cold"	S	+		+	Compression and empyema with cavity left lung tuberculosis both upper lobes	Aspiration	9 8 Rib resection for drainage	9-3-1 Mixed infection in pleural exudate	4-16 Death
734 9	M 18	0	Pneumonia	b				Fluid left lung thickened pleura tuberculosis both upper lobes	9 20 Drainage	9 16 Rib resection, drainage 27 Decortication		Wound completely healed, general condition good
74430	M 3	+	Pleurisy	6	+	+		Empyema right, tuberculosis right upper lobe		7-14-13 Rib resection for drainage -19-14 Reinjection		Health excellent, wound healed soon after second operation
67487	M 43	0	Pneumonia	I	+	+	+	Abscess left lung, tuberculosis left lung		7- 3-13 Rib resection for drainage		Following operation the patient developed pulmonary abscess of lung Death three years
67338	M 28	0	"Cold"	I	+	+	+		ulous duc-		7-18-13 Rib resection for drainage (tuberculous pleura)		Operation advised here for abscess formation Death 1914
20184	M 9	0	Scarlet fever	b	+	+			of re- lapse, left ty effus.	-14 Drainage	1 Drainage 3 16- 5 Rib resection and skin muscle plastic		Condition for permanent healing not secured
73274	M 18	0	Typhoid	I	+				r left pyema	10 14 Drainage -14 Aspiration	8-3-15 Rib resection and skin muscle plastic		Complete cure
58170	M 43	0	Trauma		+	+			apse- left,	6-16 Drainage	5-6-16 Drainage	6 6 6 Guinea pig inoculation negative	Healing not secured, condition fair
63708	M 37		Pneumonia	b	+	+	+		with left cavi- ty	904 Drainage	7-17-16 Drainage	7 17-16 Chronic inflammation of pleura	9 10 Death
58082	M 23	+	"Cold"	I	+				th re- left, ll 7	6 5 Drainage	6- 5 7 Rib resection, drainage		Results unknown
70010	M 18	0	Compression appendix and subphrenic abscess				+		acted ame- r, ter right	4 5 Compression appendix	10 -17 Rib resection, drainage 11-9-20 Exploration, 12-18-20 Rib resection and skin plastic	10- 1-17 Chronic inflammation of pleura	1-26-20 Death Immediate cause cardiac failure

1916	M	O	Infection	S		Effusion and thickened pleura left lung; tuber culosis right	0–8 Aspiration, 18 Drainage	7 to 19 Rib resection and skin muscle plastic	7–19 Chronic inflamma tion of pleura	Complete cure
1917	M	O	Infection	S	+	Thickened pleura and fluid; tuber culosis left lung		section, drain ing, Empyema sutured tight	7–8–19 Chronic inflamma tion of pleura	Complete cure
1890	M	+	Pneumonia	S	+	Thickened pleura; healed tuberculo sis both lungs	6–8 Drainage, 8 Drainage	–	rations and Da kin treatment 1–4–9 Chronic inflamma tion of pleura	Cavity still draining, plastic operation probably indi cated
1907	M	O	Pneumonia	S	+	Thickened pleura	3–17 Drainage		rations and Da kin treatment.	Wound completely healed
1906	M	+	Pneumonia	S	+	Tuberculosis of left lung; effusion	1–8 Drainage		rations and Da kin treatment. Rib resection, sat	Steady improvement
1915	M	+	Infection, pneumonia	S	+	Fluid right; tuber culosis both lungs	3–20 Aspiration	–	rations and Da kin treatment (spontaneous)	Patient convalescing
1917	M	+	Infection, pneumonia	S	+	Lung collapsed left; tuberculosis with cavity left lung	3 aspirations		11–15–20 Pleural exudate rations	Patient to return for proba ble plastic
1916	M	+	Pneumonia; pleurisy	S	+	Thickened pleura; tuberculosis with cavity left lung; collapsed right lung	Aspiration and 3 drainage open tions	3–14–20 Exploration		Improved, patient to return for dissections

extrapleural plastic operation may be performed if a cavity persists. The use of an irritating and especially of a corroding fluid, such as Dakin's solution is, however contraindicated in any case of well marked pulmonary lesion, because of the tendency to bronchial fistula and hæmorrhage from the action of the fluid on the exposed diseased area of the parenchyma of the lung

In mild, secondary infections such as pneumococcus it may be possible to treat the case as one of sterile effusion Spengler recommends irrigation of the pleural cavity with salt solution, 0 5 per cent lysol solution, or a weak solution of iodine and potassium iodide Jacobaeus recommends repeated aspiration in cases of open pleural cavities, with a view to promoting healing of the drainage opening

Tuberculous exudate in an open pleural cavity The opening into the pleural cavity in such cases may be through the chest wall due to a drainage operation or to spontaneous perforation of an empyema necessitatis or into a bronchus due to a ruptured tuberculous cavitation producing spontaneous pneumothorax. These all result in mixed infection

Cavities following drainage operations vary from those in which there is only a residual tubular or sinus tract to those in which the entire pleural cavity is involved With cavities of long duration the pleura is usually thickened Antiseptic solution irrigation in such cases is not only safe but usually is followed by marked improvement in the patient's general condition There may be very little thickening of the pleura, however, as in several cases in this series In one of these, symptoms developed suggesting small bronchial fistulæ and a lighting up of a tuberculous lesion

The hypochlorite solution seems to have little or no influence on the tuberculosis bacillus in these cases Scholl observed a case at the Rockefeller War Demonstration hospital in 1917 in which an empyema cavity of about 500 cubic centimeters capacity was treated with 100 cubic centimeters Dakin's solution every 2 hours for 10 days Cultures for tuberculosis at the end of that time were positive, showing that the solution did not kill the bacilli

GROUP IV — EMPYEMA FOLLOWING IDIOPATHIC PLEURISY WITH EFFUSION

Case	Sex and age	Pleurisy	Illness at onset	Onset sudden or insidious	Cough	Blood [illegible] in sputum	Rales	Roentgen-ray findings	Previous operations	Operations	Pathological diagnosis	Remarks
37	M		Pleurisy	I	+	+			5 operations	5 30 Drainage		Death
40047	I	(	Pleurisy	S			+		3 operations	7 7 Drainage		Result unknown
40960	M 37	+	Pleurisy		+	+				8 5 10 Rib resection, drainage	8 5 10 Pleural rachitic not tuberculous	Result unknown
41661	M 4	+	Pleurisy and pneumonia	S					Drainage	9-3-10 Rib resection drainage		Result unknown
6 803	M 20	+	Pleurisy	S	0			8 beat right	Drainage	7-3 Drainage 7 3 Redrainage		9-13 Wound healed, patient in good health
6 968	M 43	+	Pleurisy and pneumonia	S	+	+			operations	8-9-1 Drainage, 3 Redrainage 9-11 12 Re drainage		Cure
7738	M 33	+	Pleurisy	I	+	+		Thickened and retracted pleura, drainage in superficial pocket, old empyema left	4 operations, 3 drainages	12-30-14 Sclerosis, partial detoxification		9-15 Death probably from pneumonia, patient had been doing very ill
4 617	M 34	+	Pleurisy	I	0	0		Old empyema right	9-1 Drainage	6-2 6 Rib resection and skin muscle plastic 8 27-16 Drainage 8-30 7 Second skin muscle plastic	6-2 6 Chronic inflammation of pleura	10 9 General health excellent, complete cure
30476	M 3	+	Pleurisy	I	+	0		Left lung collapsed	10 operations, drainages	9 10-16 Drainage 8-31-18 Explorations and drainage		9-26 8 Death
7480	M 9	+	Pleurisy	I	+	+	+	Fluid right lung	10-16 Aspirations	10- -16 Rib resection for drainage 11-2-16 Redrainage -29 6 Redrainage 12- -16 Rib resection for redrainage		Complete cure, general health excellent
722	M 3	+	Pleurisy	S	0		+	Pleura thickening, pocket base right lung	Aspirations, drainage operations	2-16-18 Rib resection, drainage		Result unknown
28600	M 3	+	Pleurisy	S				Retraction, right lung, small pneumothorax	3 drainage operations	-13 10 Skin plastic and Ransohoff 3-1 -10 Skin plastic (bronchial fistula) 3-17-10 Small skin plastic	3-10 Chronic inflammation of pleura	Complete cure, general health very good
34884	F 10	+	Pleurisy; cold[5]	I	+	0		Old empyema, lung collapsed, right	6-10 Thoracotomy	8-10 10 Rib resection for drainage		Patient convalescent at last report

Small cavities and sinuses seem to constitute favorable cases for the use of bismuth paste Beck (5) reports a cure in about 80 per cent of 150 cases of chronic empyema, but he does not state what proportion of these cases was tuberculous Heuer reports one case in which complete sterilization of a cavity resulted from the use of the paste so that it was closed as a sterile pneumothorax, but in the case of another cavity the treatment failed

Cases of impending empyema necessitatis require preliminary open drainage, as a sinus forms if an attempt is made to use the closed method These cases, often of long standing, as a rule require later plastic operation

Tuberculous empyema with large bronchial fistula due to rupture of a cavitation into the pleura may result in a virulent secondary infection and require prompt drainage, usually by wide incision, as irrigation with antiseptics is impossible The immediate mortality in these cases is high. Often patients who survive require later plastic operation. Forlanini had 8 patients, all died Sauerbruch reports 73 cases, 57 following pneumothorax therapy, 16 spontaneous. Fifty three patients died, most of them soon after drainage operation

TYPES OF OPERATIONS FOR CHRONIC TUBERCULOUS EMPYEMATA

Drainage operation It cannot be over emphasized that the open drainage operation is contra indicated in cases of sterile tuberculous empyema. It will do no good, and is sure to do harm, by introducing a secondary infection. Withdrawal of a part of the fluid by aspiration is indicated in such cases only if the fluid gives rise to mechanical embarrassment. In 41 patients in this series drainage had been established elsewhere and the cavities were, therefore, secondarily infected Of the 35 patients who had not had drainage 5 belonged to Group 1, in which an absolute diagnosis of tuberculous empyema was made One of the patients (Case 101014) developed mixed infection following sudden pneumothorax after having been aspirated several times for serous effusion which contained the bacilli He died shortly after rib resection One patient (Case 107204) died of septicæmia 6 days after rib resection. One patient (Case 217107) presented himself with symptoms of an overwhelming infection. He died 3 days after rib resection for drainage Necropsy showed extensive tuberculous lesions and the immediate cause of death to be a perforated tuberculous ulcer of the ileum In the smear made from one patient (Case 149126), the bacilli were found A rib was resected for drainage He died 6 months after operation The fifth patient had a large seropurulent effusion following exploration for lung abscess Later examination of the excised pleural tissue showed tuberculosis The roentgen ray showed a wide-spread tuberculous lesion, the sputum was positive for acid-fast organisms The empyema cavity healed, and the patient improved remarkably and remained quite well during a period of observation extending over several months.

In 7 of the 16 patients in Group 2 with clinical diagnoses of tuberculous empyema, drainage had been instituted elsewhere On 6 of the remaining 9 rib resections had been performed for drainage, on 3 (Cases 22359, 51816 and 137779) on account of pyopneumothorax with bronchial fistulæ with associated symptoms of mixed infection One of these patients (Case 137779) also had an impending perforation of empyema necessitatis Two other patients had large amounts of sputum with marked symptoms of sepsis suggesting possible perforation into a bronchus. One of these two also had an impending empyema necessitatis. A sixth patient had three aspirations followed by prompt reaccumulation of pus She was considered in too poor condition for a radical plastic operation A simple drainage operation was performed at the patient's request, and with a view to later plastic operation Two patients were treated by aspiration only In one (Case 292083) the pus was sterile and the cavity small. The patient was sent back to the tuberculosis sanitarium from which she came, she died a few months later The other (Case 300040) was aspirated and the pus was found to be sterile He did not wish a plastic operation until after trying repeated

aspiration. He was therefore recommended to a tuberculosis sanitarium.

Ten of the 22 patients with pulmonary tuberculosis and an associated empyema had had previous drainage operations elsewhere Of the remaining 12 all except 2 had rib resection as the primary operation. Pulmonary tuberculosis was present in all of these but the general characteristics of the empyema were of the ordinary type. In 3 repeated aspiration of pus was done and the culture showed a mixed infection Cough with a large amount of sputum was present in 2 indicating a bronchial fistula The other patients appeared to have ordinary empyema In 1 of these no pus was found but an empty cavity lined with calcareous deposit

In Group 4, patients in whom empyema was preceded by idiopathic pleurisy drainage operation had been performed on 8 Rib resection was performed on the other 5

The closed method in cases of draining cavities secondarily infected is of great advantage if antiseptic solutions can be used The Dakin s solution treatment was used for 10 patients in the first group before the diagnosis had been established A small bronchial fistula developed in one case during the treatment, but it was not of sufficient size to make it necessary to interrupt the treatment In one case after a few irrigations it became impossible to use the fluid on account of coughing during which the patient tasted the fluid He developed fever and increased sputum following the treatment and lost weight. The treatment was therefore interrupted This case is an example of a type in which there is only partial incapacity from the presence of the tuberculous empyema, at the time The antiseptic solution was relatively harmless in this case and of great advantage in all of the other cases since the symptoms referable to septic absorption were distinctly ameliorated

Decortication of the lung by the Delorme Fowler method It seems questionable whether this operation is ever indicated in the presence of an extensive or active phthisis In such cases fibrosis limiting the expansibility of the lung and the danger of lighting up a latent focus must always be considered In other cases, without a demonstrable pulmonary lesion it is impossible to separate the thickened membrane from the lung Delorme writes that tuberculous empyema is not a contra indication to the operation The most favorable report found in the literature is by Violet, who reported 17 cases in which the operation succeeded in 10 and failed in 7 Tuffier states that cases in which it is difficult or impossible to liberate the lung are as a rule tuberculous

In the present series of 74 cases decortication was attempted in 6 in all before the tuberculous nature of the empyema had been recognized These cases have been reported elsewhere (33) In 5 the cavity seemed materially reduced at the later operation, but it is questionable whether sufficiently so to warrant the operation. In all these cases a later plastic operation was required In one of these (Group 1 Case 263092) in which there was no demonstrable lesion in the lung the pleura was only very little thickened but the surface of the lung was very irregular and corrugated making decortication impossible although the lung was freed up en masse In one case (Group 1 Case 289416) the surface was smooth but the pleura was thickened over the upper portion of the lung only thinning down to normal proportions toward the base In the other cases there was nothing about the appearance of the pleura to suggest the tuberculous condition shown by microscopic examination In one case (Group 3 Case 73419) the cavity was completely obliterated

Plastic operations The Estlander extrapleural rib resection, complete resection of the whole thickness of the chest wall with the use of a skin flap (Beck, 4) a skin muscle flap following a similar resection (Robinson) extensive radical resection (Schede 67) and the extrapleural two-stage or three-stage rib resection of Wilms have all been used with success in the treatment of tuberculous empyema. Beck s operation which is similar in principle to the Schede operation lends itself well to the treatment of relatively small

residual cavities following rib resection for drainage For large infected cavities the Schede operation best meets the anatomic indications, but the mortality of the one-stage operation has been as high as from 70 to 80 per cent (Spengler and Sauerbruch, Wilms)

In cases with cavities of large size, often with an associated pulmonary lesion and usually with marked debility, a several-stage extrapleural rib resection not only gives a low mortality, but offers good prospect of cure This operation is an outgrowth of an attempt to modify the Estlander operation. Jaboulay and Lemaire, instead of performing an Estlander resection of the ribs over the whole extent of the cavity, simply cut the ribs on the sternal border, Boiffin sectioned them at the vertebral border of the cavity Tietze later combined the two methods and Wilms modified it by resecting segments several centimeters long, chiefly posteriorly but also anteriorly, if necessary, and dividing the operation into two or three stages Freidrick proposed to call the procedure the Boiffin Wilms operation. Wilms calls it the Pfeiler resection, and first used the method for collapsing the chest wall in cases of uncomplicated pulmonary tuberculosis Kolb and later, Wilms, and others, applied the method to tuberculous empyema

Wilms recommends resecting 10 or 15 centimeters of the sixth to the eleventh ribs posteriorly at the first operation and 8 to 10 centimeters of the fifth to the second or first ribs, with suturing of the wound at a second operation This permits the entire chest wall to sink in, the elasticity of the sternal ends of the ribs allowing considerable mobility Only if further collapse is necessary are the sternal ends of the ribs sectioned If a cavity still persists a flap can be turned back and the rib segments and the portion of the pleura overlying it can be excised The operation can be performed under local anæsthesia, it results in but slight trauma to the tissues, the posterior incision is a safe approach to the second and to the first ribs The operation in stages and the freedom from infection in the wounds make it relatively safe for very poor surgical risks. The advantages of the operation are almost equally great in cases in which there is mixed or secondary infection but in these there is a characteristic tendency to a persistent sinus Wilms reports 12 cases without mortality and other successful cases following this operation are reported by Linderstroem

In the series of 74 cases plastic operations were performed in 12 cases in Group 1, in 3 cases in Group 2, in 4 cases in Group 3 and in 3 cases in Group 4 In Group 1 Beck's operation was performed as a preliminary operation in 3, and as a secondary operation in 9 An operation of the Schede type was performed in 5, in 1 for a draining empyema of 22 years' duration and a Wilms operation in three stages was performed in 1 That a Schede operation is the only operation that will obliterate the cavity in some instances was obvious in the case of the empyema of 2 years' standing The ribs were overriding and so much thickened that it was impossible to separate them for resection The pleura, moreover was fully 2 5 centimeters thick and very rigid In such a case very little would probably be gained by any procedure that would not include eventually a complete resection of the enormously thickened, chronically diseased chest wall

Resection of the scapula is sometimes desirable in plastic operations Hellstroem believes that it should be performed in all cases.

RESULTS OF TREATMENT

The type and sequence of the operative treatment at the Mayo Clinic is indicated in Tables II and III In these tables insertion of a tube for aspiration and Dakin's solution irrigation is listed as aspiration Drainage operations were, for the most part rib resections It will be noted that the decortication was performed with one exception as a primary operation In these cases the diagnosis of the tuberculous nature of the empyema was made from the excised pleura Plastic resections were, as a rule secondary procedures The results grouped according to the operations are shown in Table IV

The patients who had several operations are grouped under the heading of the last operation or under the operation which is judged to have contributed most to the result

TABLE II.—TYPES OF OPERATION (MAYO CLINIC SERIES)

	Aspiration	Exploration	Drainage	Decortication	Skin plastic	Skin muscle plastic	Schede operation	Wilms operation	Total
Group	13	1	36	1	1	4	4	1	55
Group	6	4	13		5				28
Group 3		8	18			5			31
Group 4			7		3				14
Total	20	13	84	6	14	9	5	1	176

TABLE III.—SEQUENCE OF OPERATIVE PROCEDURE (MAYO CLINIC SERIES)

Type of operation	First operation	Second operation	Third operation	Fourth operation	Total
Aspiration	17				20
Exploration		1			18
Drainage	41	7	4		84
Decortication	5	1			6
Skin plastic	4	8			14
Skin muscle plastic	4	4			9
Schede		1			5
Wilms					1
Total	84	27	3	1	176

obtained. It will be noted that the largest proportion of cures followed plastic opera tions.
tion on
is due
these patients.

The results are grouped according to the pathological subdivisions in Table V It will be noted from this table that of 67 patients in whom the end-results are known, about 58 2 per cent were cured or much improved 4-5 per cent were not improved and 37 3 per cent died The postoperative mortality deaths within 2 months of operation, was 14 9 per cent

Of the patients in Group 1 definitely proved to be tuberculous, 61 per cent were cured or greatly improved 39 per cent died The postoperative mortality was 21 7 per cent. In Group 2 patients with clinically tuberculous empyema, the results are known concerning 14 50 per cent were cured or much improved and 50 per cent died. The opera tive mortality was 21.4 per cent. In Group 3 patients with empyema associated with pulmonary tuberculosis, 57 1 per cent were cured or much improved 14.3 per cent not improved and 28 6 per cent died The post operative mortality was 4.7 per cent In Group 4 patients with empyema following pleurisy with effusion, 66 6 per cent were cured or improved 33 3 per cent died The postoperative mortality was 11 per cent.

SUMMARY

1 Primary or idiopathic pleurisy with effusion, in a large proportion of cases is probably tuberculous in nature

2 A past history of pleurisy with effusion is common in cases of tuberculous empyema. In many cases the effusion is serous at the onset

3 Tuberculous pleurisy may be primary or it may be secondary to a pulmonary peritoneal, or other tuberculous lesion.

4 The onset of a tuberculous effusion may be insidious or it may be sudden and associated with an acute and severe constitutional reaction. A mixed pleural infection due to the perforation of a tuberculous cavitation often runs an acute and rapidly fatal course

5 Diagnosis of tuberculous empyema is made by demonstration of the bacilli in the

TABLE IV — RESULTS BY OPERATION

Operation	Cure	Good health sense	Improvement	No improvement	Operative death	Death later	Total deaths	Unknown	Total
Aspiration			1	1		1	1		3
Exploration					1	1	2		3
Drainage	9	5	8	2	7	9	16	6	46
Decortication	1								1
Skin plastic	3	3			1	3	4		9
Skin muscle plastic	3	2	3						8
Schede		1			1	1	2		3
Wilms		1							1
Total	16	11	12	3	10	15	25	7	74

TABLE V — RESULTS BY GROUPS

	Cure	Good health, sense	Improvement	No improvement	Operative death	Death later	Total deaths	Unknown	Total
Group 1	6	7	5		5	4	9		23
Group 2	2	3	2		2	4	7	2	16
Group 3	7	1	4	3	1	5	6	1	22
Group 4	1		1		1		1	4	3
Total	16	11	12	3	10	15	25	7	74

exudate, by animal inoculation, or by examination of the sectioned pleura.

6 A sterile effusion is probably tuberculous An infected effusion may be tuberculous

7 Empyema following primary idiopathic pleurisy with effusion, or empyema of insidious onset especially in the presence of a pulmonary or other tuberculous condition, is probably tuberculous

8 Empyema may be tuberculous in spite of persistently negative findings over a long period of time

9 In a closed pleural cavity a sterile effusion, whether serous or purulent should not be treated by open drainage, except in the presence of an impending perforation of the chest wall.

10 Repeated aspiration of only part of the fluid present is indicated in cases of serous effusion producing definite dyspnœa on exertion or symptoms of circulatory embarrassment.

11 The replacing of aspirated fluid by nitrogen or filtered air may be indicated in cases in which there are symptoms of active phthisis referable to the same side as the effusion.

12 A sterile purulent effusion should be treated as though it were serous if the lung expands when fluid is withdrawn. If the lung is fixed in a collapsed condition or if the effusion persistently recurs, an extrapleural plastic operation is indicated

13 Effusion in a closed cavity showing a mixed infection should be treated by the closed method with antiseptic solution irrigation, or by open drainage, the open drainage is indicated especially in cases of severe infection associated with extensive pulmonary tuberculosis, making irrigation hazardous

14. Tuberculous empyema with a large bronchial fistula should be drained by the open method

15 A large tuberculous empyema with mixed infection from a previous drainage operation or from spontaneous perforation of the chest wall requires a plastic operation, preferably after treatment with Dakin's solution.

16 A plastic operation involving closure of a bronchus offers the only prospect of

cure in case of an associated large bronchial fistula

17 Dakin's solution irrigation may be contra indicated in the presence of an extensively diseased lung owing to its corroding action on any superficial lesion, possibly resulting in hemorrhage or the formation of a bronchial fistula

18 A plastic operation is usually eventually required in the case of closed cavities when the empyema is of long standing and of all large open secondarily infected cavities

19 An extrapleural rib resection is indicated for the collapse of closed sterile cavities The Bolffin Wilms operation is especially suitable for the collapse of large cavities without excessive thickening of the parietal pleura or rib deformity

20 A skin or skin muscle plastic is indicated for the obliteration of relatively small cavities Cases of long standing associated with greatly thickened pleura require an extensive resection of the entire chest wall after the method of Schede

21 Operation in several stages is especially indicated in the treatment of tuberculous empyema and if practicable it should be preceded by antiseptic solution irrigation Such treatment should extend the indications for operation and should lower the post operative mortality

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GASTRIC HÆMORRHAGE[1]

BY GEORGE E ARMSTRONG M D F A C S MONTREAL, CANADA

MASSIVE hæmorrhages from the stomach occur under different conditions It is not my purpose to refer to those following operation upon the stomach or to those due to leukæmia, ruptured aneurism hepatic cirrhosis and ruptured œsophageal veins, or eroded artery

There is a group of cases in which massive hæmorrhages take place into the stomach and in which, as far as I know neither the surgeon, the pathologist the bacteriologist nor the physiologist have as yet offered a satisfactory explanation for the occurrence The bleeding tends to recur at short intervals until the patient dies We have had ten or a dozen such cases in Montreal during the past 12 years They resemble each other very closely The bleeding comes on suddenly without any warning and without any recognizable predisposing or immediate cause The patients at the time are in their usual health and not guilty of any notable indiscretion

Perhaps the report of one such case may serve as an illustration

A. L age 33 a well-nourished, active, railroad

The vomiting was explosive in character A physician was called and he applied ice to the abdomen and gave him a hypodermic injection of morphine ¼ grain with atropin 1/150 He remained in bed all day taking only sips of water and a little milk and soda water At 9 30 in the evening he vomited a good quart of bright red blood I saw him soon afterward. He was blanched, pulse weak, temperature below normal, suffering from air hunger and distress in mind. The room had the appearance of a shamble The bed was soaked with blood, and

personal history there was no indication of his being a bleeder There was no history of bleeders in his family

colored blood clot, but no fresh blood When the clot was cleared out, the mucosa appeared normal, no abrasions or fissures could be seen There was no bleeding or oozing even on handling and wiping the surface of the mucous membrane A gastro-enterostomy was performed to anticipate and obviate distention, and the abdomen closed An intravenous injection of 36 ounces of normal saline was administered

morning appe

quantity of b

minutes

The findings, at the autopsy were absolutely negative A feature of interest was the abundance of hæmolymph nodes through the upper abdomen and along the aorta. One or two of these showed mottling with white as if they were occupied with secondary growth, but no tumor was found anywhere in the abdomen

The blood showed an extremely delayed coagulation time The psoas muscles were noted as particularly friable There was thus no definite source of hæmorrhage to be found, and as a whole the viscera were all perfectly healthy It would seem that there had been a diffuse oozing from all parts of the gastric mucosa Hæmophilia was excluded by the personal and family history The appendix was 9 centimeters in length The mucosa of the appendix was œdematous

In my own cases and in the cases reported to me by my colleagues, operative treatment has failed The operation has consisted in brushing over the mucosa of the stomach as thoroughly as possible with the actual cautery and gastro-enterostomy All patients died

The two more recent cases that have been admitted to my service have been given transfusions of whole blood not citrated After the transfusions the bleeding stopped and the patients were discharged from the hospital

[1] President's Address, Clinical Congress of American College of Surgeons, Philadelphia, October 14-18, 1918

The history of blood transfusion is very interesting It would seem to synchronize with the history of the Western Hemisphere. Strange as it may appear transfusion was first attempted in the human with the object of giving young blood to an old man. "The vital powers of Innocent VIII were rapidly sinking He had been lying for some time in a lethargic state, that was so deathlike as to make his attendants believe that all was over Every means of restoring his exhausted vitality had been tried in vain, when a Jewish doctor proposed to attempt his cure by means of a new instrument for the transfusion of blood Hitherto the experiment had only been tried on animals, but now the blood of the decrepit Pontiff was to be transfused into the veins of a youth, who gave him his own in exchange Thrice in fact, was the difficult experiment made It did no good to the Pope, and three boys, costing the sum of one ducat apiece lost their lives, through the introduction of air into their veins. The Jewish doctor then fled and on July 25, 1492, Innocent VIII finally expired "[1]

Samuel Pepys F.R.S , and secretary to the Admiralty in the reign of Charles II and James II mentions in his diary what he calls a pretty experiment at Gresham College, of the blood of one dog let out, until he died, into the body of another on one side while his own ran out on the other side The first died upon the place, and the other did very well, and is likely to do well. He then goes on to say "This did give occasion to many pretty wishes, as the blood of a Quaker to be let into an Archbishop and such like and as Dr Croone says, may if it takes be of mighty use to man s health, for the amending of bad blood by borrowing from a better body '

Apparently blood in its purity was the desirable objective as indicated by the following narrative, also from Pepy's diary A man that was a little frantic, that had been a kind of minister, Dr Wilkins saying that he had read for him in his church, a poor debauched man, was hired by the college for 20 shillings to have some of the blood of a sheep let into his body They proposed to let in about 12 ounces, which they computed would be what would be let in in a minutes' time by the watch. Pepys met the man afterward when he said he found himself much better and as a new man. Pepys adds that the man is cracked a little in his head though he speaks very reasonably and very well. He had but 20 shillings for his suffering and is to have the same thing again tried upon him

DaCosta of this city gives a very interesting résumé of the history of transfusion mentioning the work of Lower of Oxford and Sir Christopher Wren in 1665 and Dr Croons experiment in 1666

We are more familiar with blood transfusion for blood lost. The blood in some cases has been taken from animals. As a student on two occasions I assisted one of my old teachers in transfusing blood from a sheep to men suffering from railroad injuries and great loss of blood Unfortunately they were not successful The predominant idea was to replace what had been lost

Human blood whole or defibrinated, was for many years regarded as the correct treatment of exsanguinated patients It was afterward found that any suitable innocuous fluid gave apparently as good results when injected into the veins as did blood that the essential was to restore a degree of arterial tension and render the heart's action effective Normal saline solution was the fluid generally selected It was easily prepared the immediate results were good there was freedom from the risk of embolism and it entailed no sacrifice of blood by another The experiences of the war changed our views It was shown by Crile and confirmed by others that blood transfusion restored the blood pressure to a greater degree and that the results were more lasting than the injection into the veins of saline solution. The greater efficiency of blood transfusion may be ascribed to the contained colloids.

Transfused blood has been found helpful in many conditions but particularly in hæmor

that two definite results may be confidently expected from transfusion viz., increased coagulability of the blood and increased

[1] Life and Times of Savonarola Villari

resistance to infection It is probable that these two actions of the transfused blood explains its value in cases of gastric haemor rhage without discoverable cause and in the hæmorrhage of the newborn

That the hæmorrhage is the result of some infection, the nature of which is not yet under stood seems highly probable In recent years there has been an increasing tendency to regard melæna neonatorum as a manifestation of a micro-organismal disease Since Klebs, in 1875 found micro-organisms in the blood and in the tissues in cases of hæmorrhage and especially in melæna, many observers have

rabbits produced hæmorrhages in them

The source of the infection remains to be determined One thinks of the tonsils the teeth, the gall bladder the appendix vermi formis and the renal pelvis Internists and surgeons can recall cases of indigestion, of gastric symptoms simulating duodenal and gastric ulcer relieved by appendectomy Over twenty years ago Dieulafoy taught that in many cases of appendicitis, toxins were formed capable of producing jaundice albuminuria and hæmaturia, and also gastritis and hæmatemesis and that the hæmatemesis might be severe recurrent, and fatal He thought that ulceration of the arterioles lying beneath the muscularis, mucosa was the immediate cause and source of the hæmor rhage Moynihan has reported cases of gastric hæmorrhage apparently caused by toxins produced in the appendix, and the writer has seen cases of gastric hæmorrhage that did not recur after the appendix had been removed

Some day some bacteriologist following the lead of Rosenow will identify and culture a specific germ as the causative agent in these cr
neither
any like
further that if a larger experience demonstrates that in these cases the bleeding is arrested by blood transfusions, the logical conclusion would be that the transfused blood has increased the coagulability of the pa tient s blood and has increased his resistance to infection

At the bedside faced by a case of severe gastric hæmorrhage one may make no mistake in giving a transfusion. At least time is gained for a careful study of the patient, his physical condition, his personal and family history and the operation would put him into a better condition to stand active surgical treatment if found to be indicated

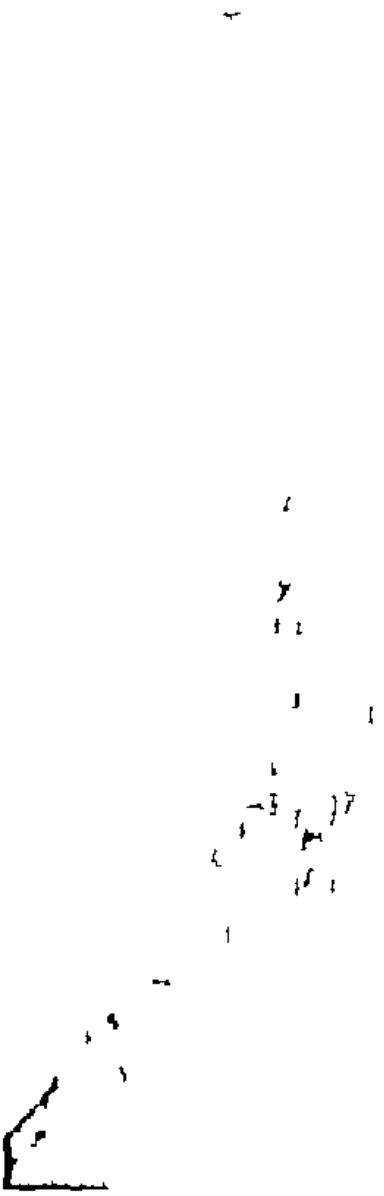
GROWTH PROBLEMS FOLLOWING OSTEOMYELITIS OF ADOLESCENT LONG BONES[1]

BY KELLOGG SPEED M D., F A C S CHICAGO

ONE of the serious and unhappy results of acute osteomyelitis of adolescent bones is that of growth disturbance It is my intention to discuss this infrequent phase of acute bone infections from a clinical standpoint, reviewing the excellent experimental work that has been undertaken dating back to 1872, to offer some practical suggestions for treatment, and to call attention to a few irregularities in the bone pathology Although most of the experimental work has been directed at the epiphysis the subject seems not to be confined entirely to derangements of that portion of the bone as I believed when first studying it There are few specific references in the literature to interferences in growth after epiphyseal separations Likewise after acute inflammatory attacks in bone, there are not many reported instances But the extent of the field involved in the study of interference with adolescent bone growth may be inferred from a few references Krabbe of Copenhagen[2] in studying 150 children suffering from precocious puberty whose bones were examined by X ray found one case of puberitas præcox in which there was a complete synostosis of the epiphyses of the long bones at an age of 7 or 8 years, resulting in marked curtailment of the skeletal growth He states that there are some 6 other like cases to be found in the literature No definite inflammatory attack could be traced in these patients Froelich[3] describing growth epiphysitis grouped under that head Schlatter's disease, Koehler's disease, juvenile arthritis deformans trochanteritis epiphysitis especially of the fourth and fifth metacarpals, scaphoiditis and epicondylitis These conditions all appear at points where the skeleton is very actively growing, they pursue a mild course and are believed to be an attenuated form of growth osteomyelitis Vulliet[4] reported two instances of lesions of the epiphysis of the calcaneus in boys 11 years of age These he believed were to be classed with juvenile deforming osteochondritis and Schlatter's disease The clinical importance of these variously named, mild, bone infections lies in mistaking them for tuberculosis of bone and in a possible misinterpretation of the remarkable efficiency of certain treatments applied An instance of the relationship of fracture of the lower epiphysis of the tibia to the arrest of growth of the bone was reported by Elmslie[5] This fracture resulted in arrest of tibial growth and resulting bowing of the fibula which continued to grow normally A roentgenogram of the involved epiphysis showed that the outer part of the affected epiphyseal area had a normal continuance of growth while the inner portion showed a marked sclerosis with stoppage of growth For the acute inflammatory types, we have a report by Hentschel[6] in which he refers to his dissertation (Jena, 1908) and cites an instance of interfered with growth of the tibia following osteomyelitis of the upper end of the bone He collected a series of cases and was inclined to divide the subject into the following points of clinical interest (1) shortening of the affected bone (2) lengthening of the affected bone, (3) defects in the bone, (4) pseudarthrosis (5) bending and other deformities McWhorter[7] reported an instance of osteomyelitis with variation in growth of the femur following separation of the distal epiphysis His patient 13 years old had already a shortening of 1½ inches and skiagraphic verification of obliteration of the involved epiphysis This result followed an infected epiphyseal separation. An instance had been seen by him also in a man 45 years of age who had suffered a bone abscess of the tibia in his twelfth year There was an increase in the length of the leg

[2] Endocrinology 9 9, Oct Dec In 2, 419
Paris méd., 2, 25, 430
[4] Schweiz med. Wchnschr 1920, Dec. 17 l, 1163.
[5] J Orthop. Surg vol 5
[6] Ztschr f. orthop Chir 1908, xxii, 1617
[7] Surg Gyn Chicago 10 9, Dec., 1449

Read before the Chicago Surgical Society December 13 10 1 (For discussion, see page 513)



1 ig The ordinary osteomyelitis of the shaft of the femur in childhood Involucrum and sequestrum formation have taken place but the epiphysis seems spared Such a condition requires delicate operative technique to avoid wounding the cartilaginous plate Prognosis as to growth good

amounting to 1¼ inches, a stimulating lesion

Various factors may influence the growth of long bones of which we may recall (1) loss of blood supply, (2) disturbances of the endocrine system, (3) inflammation or disease of the bone especially the epiphysis (4) trauma of the bone (fracture with or without injury of the epiphyseal cartilage)

The experimental work in this line dates back to Bidder[1] He inserted needles into the epiphyseal cartilage plate of the bones of dogs sometimes driving the needles through to the opposite side Whichever side of the cartilage plate was injured ceased growing so that bowing or angulation deformities followed in the limb If the whole width of the cartilage plate was damaged there was a uniform hindrance of longitudinal growth the plate becoming replaced by connective tissue or bony trabeculæ Ollier Haab Vogt,[2] and others after experimental investigation made deductions which found acceptance in surgical teaching for many years By mechanical stimulation of the diaphysis near the epiphyseal cartilage plate the bone length might be increased and minor lesions of the plate had little effect on the long growth *More extensive lesions or excisions* of the cartilage plate resulted in shortening but when an epiphysis was separated and immediately replaced no interference with growth resulted When, however the cartilage plate was fully excised there resulted complete stoppage of growth at that point

It was Haas[3] who carefully and quite conclusively investigated two points in the long growth of bones namely the relation of the blood supply to the longitudinal growth and later the localization of the growing point in the epiphyseal cartilage plate of bones In estimating the influence of the blood supply on growth he used the metacarpal and metatarsal bones of dogs. He found that—

1 Ligation and destruction of all the vessels on the dorsal surface of the dog's foot caused no disturbance in longitudinal growth of the metatarsal bones.

2 Cutting off the entire blood supply of the epiphyseal end of a metacarpal or metatarsal bone results in marked lessening of the long growth of the bones even though the main nutrient artery remains intact.

3 If the nutrient artery is destroyed there will be practically no disturbance in length growth provided the epiphyseal blood supply is not injured

4. If both epiphyseal and nutrient supply are simultaneously destroyed there will be

[1] Arch f Exper Path Pharmakol 1873 1, 148.

[2] Arch klin Chir 1878, xxii, 343.

[3] Am J Orthop Surg 1918 xv 157 305, 361.

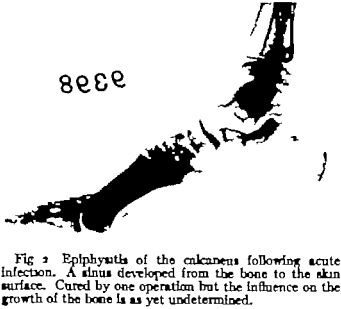


Fig 2 Epiphysitis of the calcaneus following acute infection. A sinus developed from the bone to the skin surface. Cured by one operation but the influence on the growth of the bone is as yet undetermined.

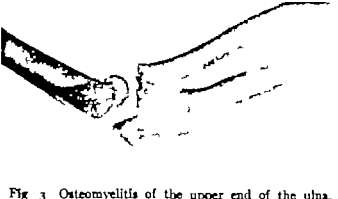


Fig 3 Osteomyelitis of the upper end of the ulna, involving the epiphysis. Cured by approach through the olecranon without causing pyarthrosis in the elbow Lack of growth at this point will cause little inconvenience

greater loss of length than if the epiphyseal vessels alone are injured, in fact, in some cases there is complete cessation of long bone growth.

5 Maintenance of normal longitudinal growth of bone is dependent upon sufficient blood supply to the region of the epiphyseal cartilage plate.

6 Function exerts but little influence upon length growth of long bones

Haas disputed the possibility of transplanting the epiphyseal ends of bones with out disturbing length growth In his effort *to localize the growing point of long bones* in the epiphyseal cartilage plate he concluded that—

1 An incision through a growing bone at the junction of the metaphysis with the epiphysis always causes disturbance in growth

2 A separation in the natural line of cleavage between the epiphysis and metaphysis after incising the periosteum causes some loss in growth

3 Excision of the metaphysis causes slight disturbance in growth

4. Excision of the epiphyseal cartilage plate causes practically complete cessation of active longitudinal growth

5 The most active and important elements necessary for longitudinal growth of bone are located in the columns of cartilage of the epiphyseal cartilage plate

6 A limited property of producing length growth is possessed by the cartilage adjacent to the growth columns of cartilage

In the light of much experimental work in the last 50 years, we may well agree with Haas[1] after accepting as a principal that the most important elements necessary for longitudinal growth of bone are located in the columns of cartilage of the epiphyseal plate that (1) the nearer the injury comes to the cartilage columns, the greater is the growth disturbance, (2) there is also a relation between the degree of destruction of the cartilage columns and the loss of growth (3) disturbances of direct blood supply of the epiphyseal cartilage plate also have a marked hindering effect on the longitudinal *growth of bone*

Acute inflammation of bone, arising either in the epiphyseal area primarily or spreading by continuity from the diaphysis may cause destruction of the cartilage plate and break down its cells to form pus as in acute suppurative osteomyelitis The neighboring and immediate supplying blood vessels become blocked with thrombi and the normal epiphyseal arteries disappear Lesser grades of infection as exemplified by Schlatter's disease non-suppurating epiphysitis, etc. similarly may cause death of the growing cells in the cartilage plate resulting in necrosis without pus formation. In these types also the vascular supply may suffer when such an attack is resolved by an infiltration of round cells Fibrous tissue usually supplants the growing cartilage cells and bone trabeculæ

[1] J Orthop. Surg pp. 1, 67



Fig 4 Fig 5

Fig 4 Osteomyelitis of the lower end of the radius with sequestrum formation The lower epiphysis is involved by continuity and growth seems to be stopped, inasmuch as the ulna has grown down past the proximal row of carpal bones Note

[illegible] epiphysis also appears not to be closed by bony growth A favorable case which bears watching before any further surgery is attempted Dr David

may grow across the epiphyseal area, completely obliterating the growth power When the young growing epiphysis is thus destroyed and the action is rapid we may compare the end results after a few weeks to a mechanical destruction or excision of the cartilage plate There will therefore follow all the phenomena that occur after experimental destruction or excision of the plate, or ruination of its blood supply namely stoppage of growth or uneven growth resulting from partial obliteration. When the part involved concerns the limb where one bone forms the framework the loss of length may be compensated by skeletal readjustments and by extra growth effort of the remaining epiphysis in that bone. If, on the other hand one bone of a companions, as in the forearm or leg, ceases growth from one of its epiphyses, the analagous epiphysis of the fellow bone continues to grow and deformities result. The normally growing bone tends irresistibly to push the slower growing bone to one side as it lags behind and as this accident always occurs near joints the articulation may suffer restriction of motion and the whole limb loses a normal axial relation which interferes with function. Decubitus sores ultimately appear over the normally growing bone ends as they force themselves on past the joint (Fig 12)

A clinical application of these experimental conclusions assumes particular interest where the forearm and leg bones are involved more especially when *one* of the two companion bones suffers growth disturbance. Arrest or exaggeration of growth of the single bone of the arm is not so important. When one humerus is shortened as compared with its fellow in the other arm, little disability may result and the loss of length may not be noticed by the casual observer In the thigh there is greater functional disturbance yet the tilting of the pelvis may accommodate itself to the loss of length in the one leg and there need follow no deformity from over growth of a companion bone none being present. (Fig 11)

If we accept the conclusions of experimental work which tell us that the greatest *interference* with long bone growth results from [illegible] the the [illegible] which may bring about this interference are fracture (epiphyseal separation) inflammation (osteomyelitis or epiphysitis) and operative removal of the cartilage. The same

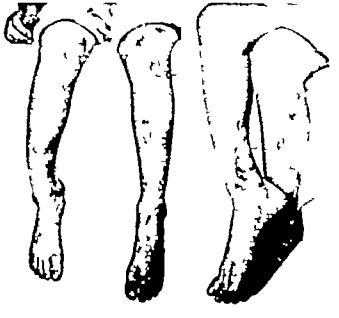


Fig 6 (at left) Osteomyelitis of the lower end of the tibia following open fracture and resulting in stoppage of growth of the lower least important tibial epiphysis. Note the fibula continues to grow and is causing a bowing deformity of the leg The osteomyelitic focus is quiet and apparently healed

Fig. 7 Lateral view of the same leg as in Figure 6 A slight drop foot is present.

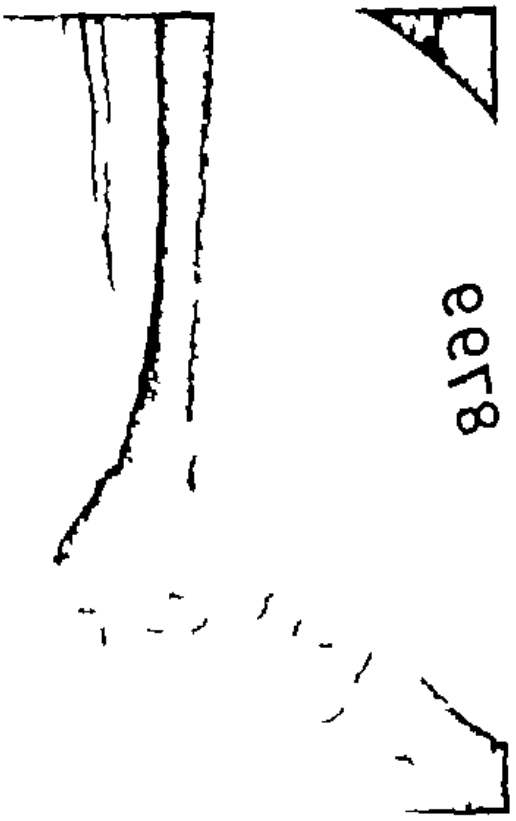


Fig 8. Roentgenogram of two planes of the leg, same case as shown in Figures 6 and 7 The inferior tibial epiphysis appears to be completely obliterated and replaced by bone. A more slowly filling bone cavity exists in the metaphysis In addition it is seen that the fibula has developed a cross union to the tibia. This followed

experimental work confirms our clinical knowledge that interference with the shaft of the bone (diaphysis) by fracture, surgical removal or inflammatory process even when the nutrient blood supply is destroyed does not interfere with adolescent long bone growth. As the epiphyseal blood supply has a strong influence on growth, we must take operative precaution to preserve these vessels especially those leading to the *epiphysis of greatest growth* in a bone

However, we are confronted by some apparent inconsistencies in the application of this fact, as in one case after a patient suffered a fairly well localized osteomyelitis of the diaphysis following open fracture of the radius which did not include the epiphyseal area, an arrest of growth resulted (Fig 14) X ray examination after 2 years failed to reveal in this patient that the epiphysis was closed or that it differed roentgenologically from its analogous epiphysis in the other wrist The osteomyelitic focus became healed following operation, and the bone was slightly sclerosed about the healed area, but the long growth did not proceed in a normal rate Experimentally, a lesion at this site in the shaft of the bone would have little or no effect on the rate of growth clinically, it did have We must seek the cause in another direction It may be found possibly in an assumption that the vessels leading to the nearby epiphysis became thrombosed and obliterated by the septic process, and pending the time when vicarious circulation might be established, the epiphysis in question ceased growth On this account the deformity was treated conservatively with an expectation that growth would ultimately return to the area (Fig 15)

Yet another pathological factor enters into the clinical interpretation of some of the instances of growth stoppage *and has great* bearing on function and treatment. Atten



A similar instance involving the inferior epiphysis of the tibia, now healed From a growth standpoint it is fortunate that the fibula has been nearly obliterated as it offers little support or tendency to cause bowing or other deformity

tion is called to cross union between two bones in an extremity particularly the forearm

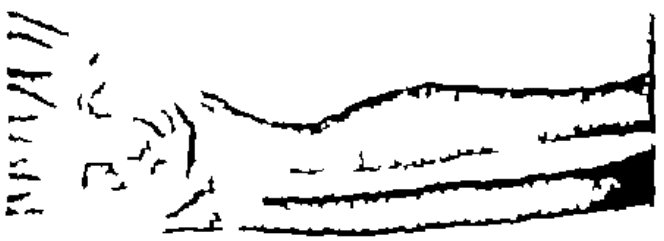


Fig 10 Old cross union of the radius following open fracture, healed The lower radial epiphysis, although distant, seemed to stop growth On its outer aspect it seems not to be obliterated A cross union has taken place between the two bones

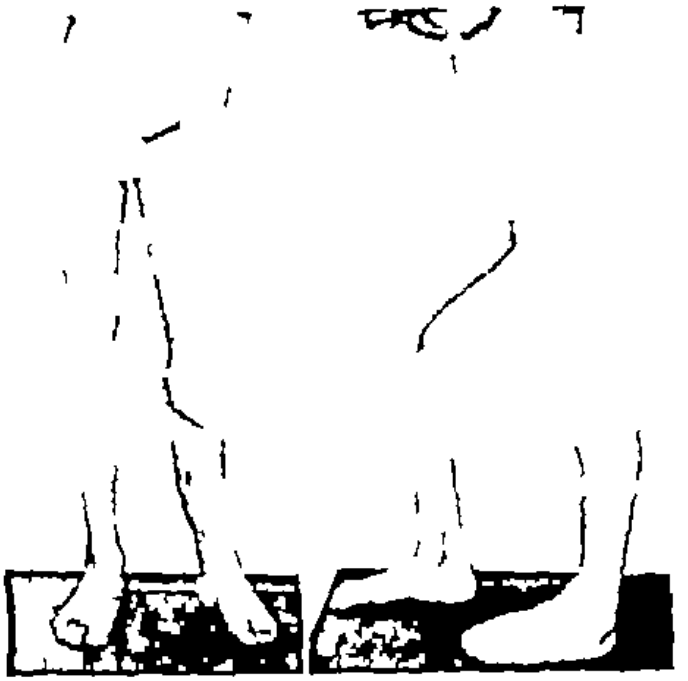


Fig 11 (at left) Osteomyelitis of two years standing healed The tibia is deformed and bowed and the knee drawn down for the shorter position

treatment necrosis

Following the septic process which usually involves the epiphyseal cartilage plate a deposition of bone may pass through the tissues or across the interosseous ligament to unite firmly the two bones by an osseous band This is cross union (Fig 10)

When the bone which has suffered destruction of its epiphysis heals it is found firmly united to its fellow by cross union This in the forearm may interfere seriously with pronation and supination. As the fellow bone continues to grow it has less tendency to produce a bowing of the forearm but as it grows down past the carpal bones it causes a more marked deflection of the wrist, and that coupled with the loss of rotation entails a greater disability The treatment we suggest is also less promising in this class (Fig 8) Multiple joints in the same patient may be involved in growth disturbance

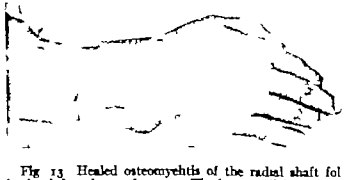


Fig 13 Healed osteomyelitis of the radial shaft following infected open fracture The lower radial epiphysis has stopped growth and the projection of the ulnar styloid downward past the wrist is clearly seen Considerable functional loss.

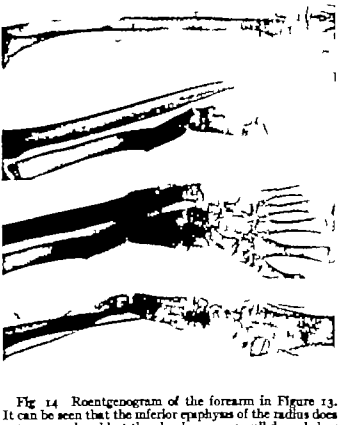


Fig 14 Roentgenogram of the forearm in Figure 13. It can be seen that the inferior epiphysis of the radius does not appear closed but the ulna has grown well down below the wrist joint

Fig 15 Postoperative roentgenogram of forearm in

TREATMENT

Because no amputations have been performed for this type of deformity, it has been impossible to obtain specimens of human bone for study An effort is always made to alleviate the condition in leg or arm without causing further injury The treatment may be divided into prophylactic and active Prophylactic treatment concerns

1 Early operation on shaft osteomyelitis of adolescent bones before the epiphyseal areas become involved or their vessels thrombosed and obliterated

2 Extreme conservatism in draining acute suppurative epiphysitis of adolescent long bones.

a Cut open the periosteum by means of one *longitudinal incision do not* reflect it any more than necessary,

b Never use a sharp curette in the epiphyseal area, wipe out granulations and drain,

c. Immobilize the limb in a suitable splint or dressing best with some traction in extension so that a pathologic dislocation may not follow, also so that drainage will be efficient

3 Warn parents of possible growth interference and examine patients frequently with X ray after healing takes place

4 If growth seems arrested apply suitable splint or apparatus to prevent deformities while waiting for growth to recommence This means in the leg especially a provision against early weight bearing without proper caliper support.

5 Protect skin over growing ends of healthful companion bone, so that pressure sores and infection may not develop

obliterated by bone but growth has ceased In it for more than 2 years Obliteration of the epiphyseal vessels may account for its lack of growth.

Fig. 16 Lateral view of the forearm in Figure 13 after operation Viewing across the wrist joint shows the normal level of the articular surfaces of the ulna and radius. The patient awaits further evidence of stoppage of growth in the lower radial epiphysis after which the lower ulnar epiphysis may be excised and the two bones will then grow evenly

Active treatment Although these problems most generally concern arrest of growth and occur in adolescents, the principles of treatment suggested might apply to overgrowth or to the correction of deformities in the adult. One must consider the age of the patient The surgeon who undertakes a curative or palliative operation must bear constantly in mind the remaining years of growth as well as the actual number of inches of growth that await the patient. In the leg this is especially important because weight bearing on a limb deformed from this cause may be seriously interfered with by mal

positions of the foot from local length changes by infected pressure sores over the ends of the normally growing bone and by changes in gross length of the limb which lead to pelvic tilting scoliosis and change of gait I have adopted therefore the following rules of treatment

1 Remember the law of nutrient arteries in relation to growing long bones i e the nutrient arteries are directed toward the elbow and from the knee and the epiphysis toward which the artery is directed unites first. The fibula is an exception of course Consequently the lower epiphysis of the femur the upper epiphysis of the tibia the lower epiphysis of the radius and ulna, and the upper epiphysis of the humerus all unite last in their respective bones and must be the most guarded

2 Unless a bowing deformity in the leg or forearm tends to manifest itself rapidly and to cause great loss of function or threaten skin necrosis splint correction of the extremity for at least 1 year is favored

3 If both clinical and X ray examination during the course of the year show that the bone is arrested in growth, a shaft resection of the companion bone remote from the epiphysis is performed to equalize length. Simple means (kangaroo tendon) of holding the resected ends in apposition are used followed by a firm splint until union takes place

4 If the child is young (many years and inches of growth expected) after 2 or 3 years when it is quite positively established that the epiphysis of the damaged bone has ceased all growth and is obliterated the analagous epiphysis of the fellow bone may be excised (epiphysectomy) to stop its overgrowth Each bone then grows at an equal rate from the remaining epiphysis and there is no fear of subsequently appearing bowing deformity Length deformity will persist

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DELTOID PARALYSIS AND ARTHRODESIS OF THE SHOULDER JOINT

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The Clinic

PARALYSIS of the upper extremities from all causes, the muscles being involved singly or in combination, is not as frequent as paralysis of the lower extremities Paralytic conditions affecting the leg generally induce a patient to seek medical relief more readily than do those of the arm for two reasons (1) the lack of locomotion is felt more keenly than is the inability to perform certain manual tasks for which after all two limbs are available (2) the therapeutic results as far as the upper extremities are concerned are on the whole not as striking and satisfactory as those on the lower extremities, which is mainly due to the fact that in the former case we have to deal with more highly complicated and specialized organs.

The foregoing facts explain why our orthopedic records show two or more lower limb cases for every arm case Incidentally we have enumerated the chief reasons why the isolated deltoid paralysis is a rather rare object for treatment by the orthopedic surgeon

The picture of this lesion (the changed contour of the shoulder undue prominence of the acromion, coracoid and humerus head subluxation of the joint, inward rotation of the arm, the flail shoulder with the limb a practically useless appendix of the body) is all the more lamentable since the well preserved function of the forearm and hand is rendered worthless through the inability of the patient to move them to the desired place of action Another point which is generally not sufficiently evaluated is the fact that through continuous overtension of the flexors and extensors of the upper arm, in the course of time, these muscles become as useless as the deltoid itself and serve to augment the misery

The treatment of both the recent and old condition may be divided into three categories the preventive, the palliative, and the curative While the first is said to confine itself to the prevention of complete paralysis by electricity, gymnastics, and massage, restoration of a completely paralyzed deltoid by these means must at least remain doubtful In the cases reported we probably have to deal with only partial degeneration or with vicarious action of auxiliary muscles, especially the supraspinatus

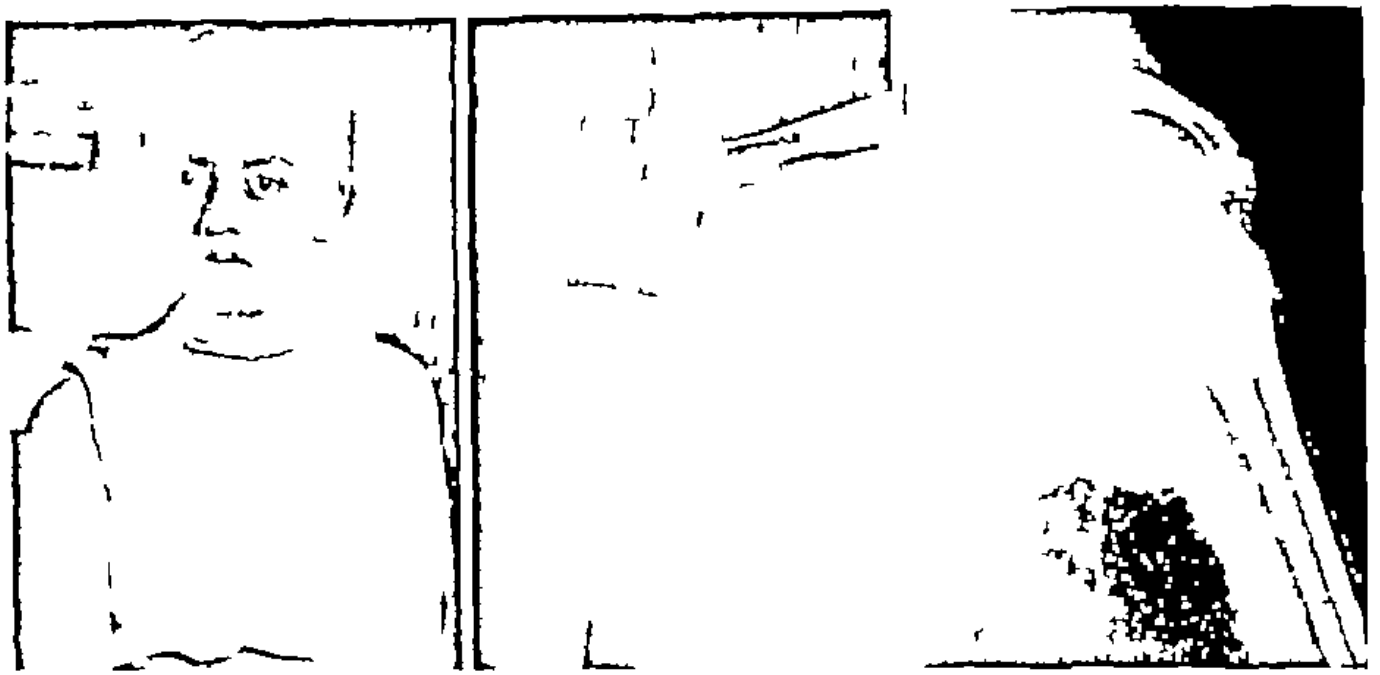
All preventive measures must necessarily end in fiasco if they are not preceded or assisted by correction of the subluxation and overstretching of the muscles surrounding the joint Therefore the wearing of a Schuessler arcushion apparatus or one of the appliances devised by Hoffa (1), Billroth and others, is indispensable However, braces of any kind have one important disadvantage Besides failing to provide the lost deltoid function, they interfere seriously with the substitution of this function by the muscles of the shoulder girdle Thus the palliative treatment as attained by orthopedic apparatus of Hoffa, Vulpius (2), Silver and others fixing the shoulder joint in a prearranged and as far as the forearm and hand are concerned, most advantageous position, naturally must remain nothing but a poor substitute for methods to be discussed later

Consequently, while the medico-mechanic treatment, as applied to recent or partial deltoid paralysis, often may be used with more or less success inveterate cases must be subjected to surgical procedures The methods in question are curative in the sense that they either provide the paralyzed deltoid with a new nerve supply (as by nerve grafting) or supplant the lost muscle action by another muscle (muscle transplantation) or they substitute the muscles of the shoulder girdle as a whole after union of the humerus and scapula—arthrodesis

The nerve graft has been applied in different variations *fifth into sixth cervical* by Harris and Low (3) median ulnar and radial into axillary by Vulpius Stoffel (4) subscapulary into axillary, and *fifth into seventh cervical* Lengfellner and Frohse (5) and especially Stoffel, have made minute investigations into these conditions and have put the deltoid nerve surgery on a firm anatomical and physiological basis But, as far as the results are concerned, they leave much to be desired The applicability only to fresh cases with little degeneration, the long time of waiting for success the complicated after treatment and then, in the best event, a rather weak deltoid action, do not elevate the nerve transplantation very much above the results obtainable by medico-mechanic therapeutics

The muscle or tendon transplantation offers the second possibility of replacement In 1892 von Winiwarter made the first attempt at replacing a paralyzed deltoid by a part of the pectoralis major with a moderately good result Later Hoffa (6) used a part of the trapezius So did Bradford (7), Dean Lewis (8), and Tubby (9) The cuts illustrating Hildebrandt s method (10) in every book on surgery, vouch for this author s success Lengfellner and Frohse (11) also investigated this subject extensively with results which are well worth studying by one interested in these procedures Only the uncertainty of the results and the magnitude of the operation with its resulting scars and deformation leave not much room for doubt that for some time to come a much simpler operation with more positive results will be the method of choice I have in mind the arthrodesis of the shoulder joint

The development of the shoulder arthrodesis operation dates back as far as 1879, when Albert (12) the inventor of the principle of the arthrodesis operation applied it in the case of a young girl. After him Wolff (13) Karewski (14), Hoffa (15) Bothézat (16) Vulpius (17), McMurray Naughton Dunn (18) and others (19, 20 21 22 23 24) have done the operation with more or less satisfaction. The earlier operators failed to achieve bony union and therefore considered the shoulder joint not a very favorable subject for arthrodesis Hoffa (15) says pessimistically ' *The arthrodesis of the* shoulder joint in any case must remain the *ultimum refugium* and can only be recommended as such *A true ankylosis cannot* very well be produced by it." This latter



Fig

Fig

Fig 3

Fig 3 Postoperative (weeks) roentgenogram of shoulder joint The humerus is firmly united to the scapula, the bony fusion in the glenoid fossa is shown, the osteo-

situs action (assigned by some authors to the operation itself and urged as an objection) is here shown t exist prior to oper tion

Fig 2 Ante operative roentgenogram, showing subluxation of shoulder joint

sentence hits the crux of the whole situation If we desire an excellent and permanent result, we must avoid fibrous union by all means Fibrous ankylosis interferes considerably with the endurance of function, the fibrous tissue not being able to stand the wear and tear Fibrously ankylosed joints easily become tired even to the degree of painfulness and are much liable to subsequent contracture More in the shoulder joint than in any other only a sufficient bony fusion will meet the ideal purpose of the operation which is to transfer motion abduction flexion extension and rotation from the muscles of the shoulder girdle through the scapula to arm and hand a task involving considerable leverage torsion and side strain especially in case there is any weight to be handled by the arm This statement is clearly borne out by a review of the cases operated upon in so far as patients with proven bony union in correct position also show the best functional results. No wonder then, that surgeons in latter years trying to free themselves from the pessimistic attitude of the earlier operators, see in bony fusion of the joint the ideal of the procedure and use every means of scientific advancement to attain their aim In order to show how this is done with the outlook for a good result, a description of a typical operation for arthrodesis of the shoulder joint, used by myself is given, followed by a discussion of the essential points with a few illustrations at hand

The essentials of a good technique are large access to the joint and firm fixation in the proper position The paralyzed deltoid does not need to be considered. Generally it appears as a thin platysma like, degenerated structure The circumflex nerve also does not require consideration

The operation is done as follows

1 An incision 4 inches long is carried from a point half an inch internal to the acromioclavicular joint downward to the outer side



Fig 4

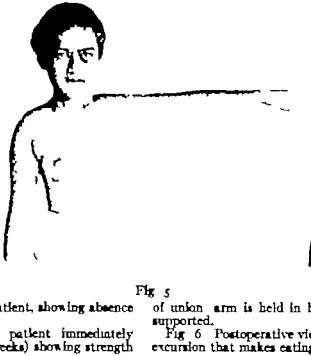


Fig 5



Fig 6

Fig 4. Postoperative view of patient, showing absence of scoliosis and position of scapula

Fig 5 Postoperative view of patient immediately after removal of plaster cast (12 weeks) showing strength of union arm is held in horizontal position and is unsupported.

Fig 6 Postoperative view of patient, showing range of excursion that makes eating hairdressing etc. possible

of the pectorodeltoid groove, embracing skin, fat and deltoid

2 The joint is opened alongside and internally to the biceps tendon from the tuberculum supraglenoidale to the insertion of the capsule on the collum anatomicum

3 Lift the tendon out of the sulcus inter tubercularis and displace it laterally

4 Now the capsule is dissected off the anatomical neck, backward and forward rotating the arm inward and outward, until broad access to the joint is gained and the head of the humerus can be conveniently dislocated The synovia then is excised and curetted away as thoroughly as possible, under careful observation of the integrity of the biceps tendon

5 Rotate the arm strongly outward pushing the head of the humerus far out of the wound With knife and rasp remove all cartilage down to the spongiosa Subject to the same process the glenoid cavity, not only in its center, but also the borders right out to the labrum glenoidale, carefully preserving the insertion of the biceps tendon Vivify the lower surface of the acromion It is polypragmaty to do the same with the coracoid process

6 With an assistant fixing the scapula in normal position return the head into the capsule and in close apposition to the glenoid cavity and the acromion In order to give the patient the most use of his hand the joint must be ankylosed with the humerus at about right angle abduction to the body, viz , the external border of the scapula from 80 to 110 degrees to the axis of the humerus somewhat rotated inward and slightly flexed This is the position by which the hand not only can reach the mouth, head and neck, but also the upper arm later will comfortably touch the lateral chest wall while at rest.

7 With the arm in this position a hole is drilled through the acromion into the center of the humerus head, the drill left in place, a small dowel peg secured from the tibia and, after removal of the drill driven into the hole

8 Now the smooth intertrochanteric groove, to the extent of about one inch, is transformed into a rough bony trough, by lifting up a bone-periosteum door into which the biceps tendon is buried, with the door fastened over it by kangaroo tendon sutures in other words, a tenodesis is performed

9 Close the wound with fine catgut in layers taking up the slack in the capsule

10 Immobilize over aseptic dressings by a plaster cast embracing chest shoulder operated on, extending to the middle of the

forearm with the elbow in flexion such immobilization to last undisturbed for 12 weeks

The main points of the operation described are first most thorough removal of the synovialis second the most radical removal of all cartilage down to the spongiosa third the strict avoidance of all foreign non absorbable fixation and suture material fourth the use of the upper part of the biceps tendon for a fixation purpose

As to the first point Sir Astley Cooper (25) a hundred years ago has drawn our attention, among other causes for non-union of intra capsular fractures of the hip to the detrimental action of the joint fluid which forces its way between the fragments and thus efficiently prevents union mechanically and possibly in other ways Others (26 27 28) from time to time have enunciated the same fact There is no reason for the belief that conditions in the operation under consideration (or in fact in every arthrodesis) are not greatly similar Consequently we must prevent the secretion of synovial fluid This can efficiently be done only by the thorough excision of the synovial membrane

The second important point of the operation is the removal of all cartilage It is a well-recognized fact in bone surgery that the extensive contact and unobstructed access of the medullary osteoblasts to the scene of action make for success while interposition of fibrous or its relative cartilaginous tissue forbode delay and failure Thus from a mechanical as well as a physiological standpoint, extensive adaptation of the former joint surfaces denuded of all cartilage is essentially necessary

As to the third point, the choice of fixation material I have been fully converted to the view of Albee (29) who does not use non-absorbable material for the reason that it is conducive to irritation of the tissues, bone destruction inhibition of bone growth, lowering of vitality and subsequent infection. Consequently the use of wire, as applied by many surgeons in the past, is to my mind a surgical sin, which ought not to be committed in the presence of physiologically correct material. In the case *sub judice* autogenous bone graft and kangaroo tendon will satisfy the taste of the most fastidious operator and their use cannot be recommended highly enough. The fixation by bone graft dowel peg a child of the inventive mind of Albee, is recommended and used by this author also in the arthrodesis of the shoulder joint. It not only furnishes an excellent means of firm fixation, but also stimulates osteogenesis and osteoconduction eventually leading to a strong union between humerus and acromion which can not be obtained in any other way Most of the other authors have used wire or silk In this respect it is interesting to hear what Lange (30) one of the most ardent investigators and advocates of foreign body implantation has to say According to this author tin (stannum) is the metal most acceptable to the tissues while all other metals especially silver lead to severe irritation Silk may easily and as a rule permanently heal in after it has been boiled in a solution of hydrargyrol oxycyanide 1-1000 But why I ask use these materials, after the non-irritability of autogenous bone and kangaroo tendon has been proven beyond doubt by practical use in hundreds of cases?

The innovation of the intra-osteal tenodesis in this operation has suggested itself to my mind for the reason that after the arthrodesis there is no more use for a sliding tendon over the shoulder joint Thus the point of origin of the biceps tendon may just as well be transferred onto the upper end of the humerus and the supra articular portion of it used for the strengthening of the superior circumference of the arthrodesis where the strain is greatest This arrangement incidentally makes for the most advantageous working of both Roux's and Wolff's laws, thus securing the ideal of the operation bony union

Under point five of the description of the operation I have thought it superfluous to pay any attention to the coracoid process as advised by a number of surgeons A look at the anatomical conditions will tell the reason It is hardly possible by any manoeuver to bring the head of the humerus into apposition with the glenoid fossa, the acromion and the coracoid process at one and the same time unless one chooses to fracture the acromion

as one author suggests This in my mind is an unnecessary act and out of proportion to the advantage gained

The question, as to when the arthrodesis of the shoulder joint is indicated, from the foregoing may be easily answered Any case of flail shoulder, with fairly well preserved spino- and thoracoscapular musculature is a fit subject for the operation In addition it may be mentioned that in the interest of the upper arm muscles it is desirable to operate on these cases, before overtension and the atrophy of inactivity have had their telling effect, in other words, as soon as the fact of a permanent paralysis of the deltoid is well established

Failure, complete or incomplete, in the outcome of the operation, which means lack of humeroscapular fixation or uselessness of the arm, will be extremely rare, as long as the operation is done after proper evaluation of pre-operative conditions and with careful observation of the technique described

Among the disadvantages of the procedure have been mentioned the formation of fistulous tracts with the expulsion of the foreign materials used, an objection which is void with the use of the technique discussed, second, two disadvantages of a cosmetic nature, the upward displacement of the scapula by trapezius action (Fig 1) and the supposed secondary scoliosis Both of these latter points have been proven to be without significance by Vulpius (31)

Accordingly, we see that the advantages of the operation, which may be summed up by stating that a useless extremity of the body is reinstated and a hopeless condition for all practical purposes cured, far outweigh the only real disadvantage, viz , the creation of a pathological condition by stiffening a movable joint.

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HUMAN ACTINOMYCOSIS

With Special Reference to Source and Mode of Infection

By W W MATTSON M D Tacoma Washington

ALTHOUGH the disease lumpy jaw in cattle was first described by Le Blanc in 1826 it was not until 1877 that Bollinger and Hartz discovered the specific micro-organism and gave to it the name actinomycosis bovis Israel and Wolff shortly afterward isolated the same organism in pus of an empyema in the human subject Since the discovery of Wolff and Israel there have been many and varied human manifestations of this disease reported in the literature This is especially true for the past decade due in a large measure to the fact that many of the earlier cases went undiagnosed though some investigators believe that this disease is gradually becoming more prevalent in this country

BIOLOGICAL CHARACTERISTICS

Widely different descriptions of the biological characteristics of the specific micro-organism have been reported The first extensive biological studies were made by Bostroem (1) who in 1890 published a report of cultures from 11 cases of actinomycosis of the jaw in cattle The micro-organism obtained from each of the cases apparently belonged to one species This micro-organism he describes as one which grew best under aerobic conditions on all culture media in the form of masses of branching filaments forming nodular membranes or layers which assumed more or less of a reddish color In old cultures the surface of growth became white in color and this change in color corresponded to the transformation of the superficial filaments of the growth into rods and round coccus-like bodies. These coccus-like bodies he regarded as of the nature of spores The organism grew at room temperature on all media and even on sterilized water

Wolff and Israel (2) one year later report having isolated from two cases of actinomycosis in man an organism with totally different cultural characteristics from that of Bostroem The organism they isolated grew best under anaerobic conditions and did not grow at room temperature Its growth was much less luxuriant than that of the Bostroem organism Animal inoculation gave the typical lesions of actinomycosis in each instance

Wright (3) in 1905 reports results of a biological study of micro-organism of actinomycosis which closely parallels the work of Wolff and Israel He isolated the organism in pure culture from thirteen cases of actinomycosis in man and from two cases in cattle These micro-organisms he believes to be all of one species as the difference among the various strains were no greater than among the various strains of tubercle or diphtheria bacilli He found the organism to be essentially an anaerobe which grew well only in agar and bouillon cultures and in the incubator In other culture media and at room temperature its growth was slight or not at all The clubs of actinomycoses were produced only by immersing colonies of the micro-organism in animal fluids, such as blood serum and serous pleuritic fluid He found all the strains studied capable of forming the characteristic club-bearing colonies in the tissues of experimental animals inoculated As a result of his study he concludes that but one species of micro-organism is the characteristic infectious agent in typical actinomycosis and that is one with the properties and characteristics of the organism he has described He does not accept the work of Bostroem because Bostroem did not show an agreement in morphological and biological characters between the micro-organism of the cultures and the micro organism of the lesions as he did not reproduce in his cultures characteristic pathogenic action upon animals as his animal inoculation experiments failed to reproduce the lesions of actinomycosis

In view of the fact that Bostroem found the micro-organism in only a very small pro-

portion of his cultures, Wright believes it highly probable that the organism described by Bostroem to be due to a contamination by one of the nocardia group which differs widely from actinomycosis in having spore-like reproductive elements and being widely disseminated in the outer world That a nocardia ever forms the characteristic lesions of actinomycosis in man or cattle has never been convincingly shown, and therefore in fections by these organisms he believes should be called nocardiosis and not actinomycosis, the latter term he would reserve for all cases of infection with the true actinomycosis bovis micro-organism

There are many other published reports bearing on the biology of micro-organism of actinomycosis, most of which show much which is contradictory and confusing Some writers believe the disease is due to infection with two or more distinct species of micro organisms while others believe that only a single species is concerned Further con fusion has been brought about by some writers who have classed with antinomycosis certain other suppurative processes which differ from typical actinomycosis by absence of sulphur bodies and which are known as pseudo tuberculosis or cladothrix infections On the whole, the work of Wolff and Israel seems to have been most uniformly accepted and has been confirmed by careful and painstaking studies by Wright and others in late years

ORIGIN AND MODE OF INFECTION

Because this organism does not grow well on all ordinary culture media and practically not at all at room temperature, Wright does not believe that it has its usual habitat out side of the body but that it is very probable that it is a normal inhabitant of the secretions of the buccal cavity and of the gastro-intestinal tract both of man and animals though he has no proof to substantiate this theory He believes that the part played by foreign bodies so often found in actinomycotic lesions is not that of carrier of the micro-organism into the tissues from without, but that the foreign body by its traumatic irrita tive effect furnishes a nidus in tissues, through which infection takes place from organisms normally present in the secretions of buccal cavity and gastro intestinal tract

In view of the observations of Wright and the lack of any evidence that actino-mycosis was a contagious disease, Lord (4) investigated teeth and tonsils as a source of infection From the contents of carious teeth and tonsillar crypts of patients without actinomycosis he made intraperitoneal in oculations of guinea pigs, and succeeded in producing omental tumors histologically identical with actinomycotic tissue and con taining typical club-bearing actinomycetic granules in three out of five animals inoculat ed, or 60 per cent of the inoculations in both instances This he believes indicates the buccal cavity as the source of the disease In explanation of the infrequency of the disease compared with the numberless chances for infection he cites five negative inoculation experiments in his series in which organisms resembling actinomycetes were present in the smears from the extracted material the organism having failed to multiply in the body of the animal, due as in other infections to the varying numbers and vitality of the seed and fertility of the soil Another factor of probable hindrance to infection he believes is the number and virulence of organisms occuring as a mixed infection with actino-my cetes

That Lord by his work has demonstrated that the organism of actinomycosis may be an inhabitant of the oral cavity in cases showing no clinical manifestations of the disease cannot be questioned, however, it does not materially strengthen the theory of Wright that this organism is a normal inhabitant of the oral cavity and gastro-intestinal tract The fact that true dichotomy sometimes occurs in leptothrix according to Israel, renders it impossible at times to differentiate leptothrix from the streptothrix forms of actinomy ces, in fact he reports having found forms in colonies of leptothrix from dental mucus, which had analogous growth to the clubbed bodies of actinomyces but differing in having no radial arrangement. The pos-sibility of Lord having dealt with this organ ism in his negative inoculation experiments is open to consideration

It would hardly seem possible that the organism of actinomycosis could exist as a normal inhabitant of the oral cavity and gastro-intestinal tract without giving rise to pathological manifestations more frequently than it does The dentist and oral surgeon would surely encounter this disease quite frequently following manipulations about teeth and oral cavity causing abrasions of gums and oral mucous membranes, a predisposing condition to infection—yet such infections are unheard of Likewise in surgery of the gastro-intestinal tract the same holds true Never in all the thousands of operations performed at the Mayo Clinic has there been a single case recorded of postoperative infection by this organism Neither do we find a single case reported in the literature where such infection has taken place

There is much evidence pointing to a source of infection originating outside of the human body Most writers are agreed that the organism when not living as a parasite on man and other animals is essentially either a saprophyte living in the soil or parasites of higher forms of vegetable life

Some observations have recently been made at the Agricultural Experiment Station at Geneva, New York by Conn (5) who by culturing various soils has shown that actinomycetes average about 38 per cent of the total flora of sod soil, and only 20 per cent of the total flora of soil under cultivation or nearly twice as plentiful in sod as in soil under cultivation He has also shown that the number of actinomycetes in sod soil increases as the sod grows older He states that observations are at hand indicating that actinomycetes occur in the soil not as filaments, but as chains of short rods or cocci closely resembling ordinary bacteria Considering this as the normal mode of growth of this organism in the soil he gives two explanations for his findings. One is that sod soil is more favorable for growth of the organism under anaerobic conditions He however did not find a decrease in the actinomycetes by aerating the soil The other explanation which has been considered is that the actinomycetes are active in the decomposition of grass roots or perhaps of plant roots in general.

Liebman has been quoted by Chretien (6) as having performed some interesting experiments on seed inoculations with actinomycetes He inoculated the seeds of beans lentils, and barley and the plants and the parasites developed simultaneously The plants were invaded by short rod like bodies, and by forms of the fungus found in animals as well He was able to infect animals from these and also succeeded with his inoculations into other media He also pointed out that the streptothrix actinomycotica becomes attenuated by passing through the animal body but regains its virulence after being grown on a plant

The observations of Conn and of Liebmann are of interest when applied to the reported endemics of actinomycosis among cattle fed on grain from certain fields Jensen (7) a veterinarian, reports an endemic of actinomycosis in Seeland due to eating rye grown on newly cultivated soil reclaimed from the sea He mentions an instance of a farm where nearly the whole of the young stock, about thirty in number had actinomycosis after feeding on mixed forage grown on a certain field Two years later the same disease occurred in the same stalls in four animals after being fed on barley straw from the same field

According to Jensen the fungus grows on grain, husks, and straw of different cereals but most abundantly on barley which is also the most likely to wound the mucous membrane Johnes (8) observations tend to corroborate this view for in twenty two out of twenty four cases in which he found barley sticking in the tonsils of pigs he found the beard thickly beset with a fungus very similar to if not identical with, the ray fungus Bostroem found the remains of grain or its sheath in lesions of eleven of his cases. Numerous observations similar in nature have been made since

McKenty (9) has likewise noted the endemic nature of the disease, in reporting thirty-seven cases of human infection at the Royal Victoria Hospital at Montreal He states that with the exception of three or four cases they all come from locations within a hundred miles of Montreal One small

strip along the St. Lawrence River furnished a large number of the cases, and the other locality was south of Montreal and in the Eastern townships Older writers frequently speak of endemics occuring in the salt marshes of Europe, as well as newly cultivated lands reclaimed from the sea

That grain and grasses play an important rôle in human infections as well as in animals has been convincingly shown clinically

Soltmann (10) reports a case of infection in a boy 11 years old as a result of swallowing an awn of wall barley The boy became very ill and suffered great pain behind the sternum extending to the back An abscess formed, covering an area extending over six inter costal spaces, and when opened the awn of barley was found in the evacuated pus A subsequent examination of the pus showed infection to be actinomycosis

A similar case is reported by Cope (11) in a boy of 10, who accidentally swallowed a blade of grass which lodged in region of right tonsil Subsequently a swelling developed behind the angle of the right jaw In a month's time softening occurred and abscess upon being opened discharged typical sulphur bodies Later the piece of grass was discharged through the sinus

In many cases where infection has taken place without grains or grasses acting as foreign bodies, there is a history of the patients having been habitual users of straw or blades of grass and hay as toothpicks or have habitually carried them in their mouth Poncet reports such a case where the patient an old woman carried wisps of straw in her mouth with which to tie up the vines in her vineyard

Maas (12) reports two interesting cases of infection from chewing grain The patients were both strong and robust young men who prior to their illness were occupied in unload ing a stranded wheat steamer in Lake Erie and frequently chewed the raw grain Both subsequently developed actinomycosis in the cervical region A parallel case is reported by Leith whose patient carried raw grain in his pocket to chew on at odd moments

Hummel (13) reports a case of actinomycosis of upper jaw caused by a piece of oat chaff which had evidently entered through mucous membrane of mouth He states that twelve other cases have been reported in the German literature in which the infection was found to be due to a foreign body, usually a piece of barley corn or some other kind of grain

Thus it would seem that clinically at least grains and grasses are well established sources of infection in human actinomycosis as well as among cattle That the nature of the soil on which grains and grasses are grown is a factor in its ability to produce infection also seems plausible in view of the reported endemics among cattle and the experimental evidence of Conn and of Liebmann

Since Wright by his cultural experiments has shown that the organism of actinomycosis as found in man and lower animals is not capable of existing in the outer world it seems highly probable that this organism must be capable of a dual existence In the outer world its existence is that of a soprophyte in the soil which under certain con ditions is capable of becoming parasitic upon higher forms of vegetable life, and in this state it assumes its pathogenicity for man and lower animals Once it gains access to the tissues it becomes attenuated and assumes totally different cultural and mor phological characteristics which are not in keeping with its existence in the outer world Whether or not this dual existence is due to the fact that the actinomyces organism is a spore former is a mooted question among bacteriologists The bulk of the evidence seems to favor the belief that it is not a spore forming organism but a true fission fungus which may be looked upon as a link between the bacteria on one hand and the lower fungi on the other This in a larger measure seems justified by the habitat of the organism

Direct transmission of this disease to man from lower animals has been denied by many observers While direct inoculation experi ments from man to lower animals have been successful there has not been a single case recorded in the earlier literature in which direct infection from lower animals to man took place. This is in keeping with our

knowledge of the parasite since Liebmann has shown that the organism loses its virulence in passing through animals There have, however been a few cases reported in this country which would seem to show that direct infection is possible Such are the two cases reported by Ochsner one of whom drove a horse afflicted with 'lumpy jaw' and the other a cattle dealer who frequently handled cattle affected with the disease. There is but one case on record in which direct infection from man to man has taken place McKenty reports such a case in which a Royal Victoria Hospital nurse was infected by a patient with actinomycosis under her care

That infection may take place by mere contact seems to have been definitely ruled out by Salmon (14) who put twenty-two healthy cattle with infected ones for a period of four months and not one of them developed the disease Milk infection seems highly improbable as the mamm of cattle are rarely infected and the disease is practically unheard of among infants. That infection may take place through improper meat inspection seems also out of the question as the ordinary process of cooking destroys the organism and is satisfied that this means of infection may be ruled out, as he has noted the disease among strictly orthodox Jews, who exercise extreme care in examining cattle intended for food In view of such convincing evidence it is no wonder that many observers are inclined to disregard the possibility of transmission of this disease to man from lower animal That it does take place, however and more frequently than we have hitherto been led to believe the results

uses

as prepared

and sent to each of forty cases which had been treated at the Mayo Clinic prior to January 1 1917

1 Have you ever in any way come in contact with horses or cattle afflicted with lumpy jaw" or any disease simulating it, such as old ulcers or swellings about the animal's head or neck?

2 Have you been in the habit of chewing on straws or blades of grass or picking your teeth with same?

3. To what extent have you eaten of fresh uncooked vegetables such as lettuce celery etc?

4 Have you at any time had decayed teeth or other tooth troubles

5 Are you now or have you ever been entirely free from this disease since you first began taking treatment?

6 State as accurately as you can what has been the course of the disease and what treatment you have carried out since leaving the Mayo Clinic

As a result 26 cases were heard from and out of this number a definite history of animal to man infection was obtained in 15 cases or 57 per cent of this number had treated cattle for lumpy jaw prior to onset of their infection while 2 had treated horses for suppurating wounds about head and neck of animal Of the remaining 11 cases in which no history of exposure was obtainable, each and every one admitted a fondness for chewing grasses and straw and habitually picking the teeth with same Each case also gave a history of dental caries and pyorrhoea to some degree While this series of cases is not large it seems to emphasize the point that transmission of this disease from lower animals to man is more frequent than infection direct from grain and grasses at any rate it is far more frequent than we had at first believed it to be

The results of clinical and experimental study early brought out the fact that the organism of actinomycosis required a twofold condition in order for infection to take place. First, the organism must by some means be conveyed to one of the portals of entry of the human body Second in order for infection to take place an abrasion of some sort in the tissues is necessary Johne and others fed cattle on virulent cultures and yet did not succeed in producing the disease It was likewise noted clinically that cases of infection about the jaws and oral cavity never gave rise to infection in the gastro-intestinal tract A clue to the necessity of an abrasion in order for infection to take place was given by the frequency with which infection took place following feeding of rye or barley to cattle the beards of the grain frequently piercing the mucous membrane and producing the necessary abrasion. Israel and others frequently traced cervicofacial actinomycosis to carious teeth which were always on the same side on which

infection took place The rare cases of infection of skin and superficial parts of the body as a rule followed wounds or abrasions of some sort. The frequency with which infection follows lodgment of foreign bodies either in gastro-intestinal or respiratory tracts which pierce or cause abrasions of the viscera, all tend to establish without a doubt the necessity of an abrasion of some sort before infection can take place

PORTAL OF ENTRY

By far the most common portal of entry is the oral cavity, next in frequency the gastro-intestinal tract, third, respiratory, fourth through abrasions on skin

In the oral cavity the most common site for infection to take place is about a carious tooth or where there is a pyorrhoeal tendency In a large percentage of this series of cases a previous history of dental difficulty was given The trouble often begins with a tooth ache which patient cannot localize definitely to any one tooth He often gives a history of having had several teeth extracted in an effort to relieve the pain. Subsequently there is swelling in the cervical region or jaw of affected side One of the cases here reported began as a unilateral sore throat and subsequently developed a peritonsillar abscess on this side, which was lanced and proved to be actinomycotic. Two other cases developed on buccal mucous membrane opposite a sharp carious tooth which had caused an abrasion in this region. One man was an inveterate tobacco chewer and said he always kept a cud of tobacco on this side of his mouth and frequently bit inner surface of cheek so it bled Invasion from lower jaw and into cervical region is more frequent probably because the lower teeth are more frequently carious

Infection is rare in the superior maxilla Only one case in this series and one was reported in literature Our case, began in the left upper second and third molars He had had both teeth extracted The swelling appeared in the left temporal region a few weeks later It was incised and drained three times Then it spread to the supra orbital region and again drained Backward

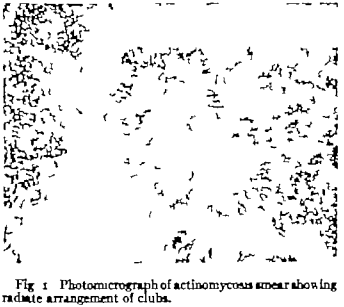


Fig 1 Photomicrograph of actinomycosis smear showing radiate arrangement of clubs.

extension took place through the orbit and in a few weeks patient developed meningeal symptoms and died

In the intestinal tract, there are two modes of invasion One which is very rare, is the generalized infection of the entire mucous membrane of intestinal tract. The fungus-filling glands of Lieberkuehn with a white coating over the entire surface of the mucous membrane consisting of mycelium of the fungus was first described by Israel Only one case is reported in literature to date, that of Chiari The other mode of invasion which is quite common, is through the appendix In the region of the appendix there is a stagnation of the fæcal current—favoring the lodgment of foreign bodies and the production site of small ulcerative areas Perforation of swallowed foreign body may cause actinomycotic infection anywhere in gastro-intestinal tract

In the respiratory tract there are also two modes of invasion One through a catarrhal affection analogous to a bronchitis which is very rare, only one case being reported in the literature and one case in this series, the other and more common mode of invasion through a destructive disease of the pulmonary parenchyma itself If no pleuritic adhesions form the disease may run a course similar to ordinary tuberculosis However if pleura once becomes involved, there is rapid spread by continuity to the chest wall The most frequent mode of infection is



Fig 2 Cervical actinomycosis with discharging sinus and linear puckering



Fig 3 Actinomycosis of jaw with multiple discharging sinuses

through dust inhalation by men who follow grain threshing The disease may also follow infection from an aspirated tooth or other foreign body—or by direct extension from neighboring organs.

Skin infection is rare and only through abrasion of skin does it take place

PATHOLOGICAL FEATURES

While this organism shows its best growth in connective tissue and shows a predilection for connective tissue in its spread through the system my findings do not agree with some authors in its being wholly limited in its growth to connective tissue alone. Cope does not believe extension to the peritoneum ever takes place In one case in this series which came to autopsy the original site of infection was the appendix, and this patient showed multiple invasion of the peritoneal surface of the small bowel as well as extension to the liver lungs spleen and kidneys (Fig 6)

It is practically certain that lymphatic metastases do not take place and this is a point in the differential diagnosis between tuberculosis and malignancy There are cases recorded in the literature of pyemic actinomycosis. George Dean reports such a case with actinomycotic endocarditis. Ponfick in 1882 records two cases also one of Israel's first cases was of pyemic nature These were all due to rupture of an abscess into a large vessel—a very rare occurrence. Otherwise extension of the disease occurs by continuity only No tissue is immune to infiltration by it in its spread Occasionally in the cervical region it may travel for considerable distance under skin and leave no signs of the disease in its wake It invades bone either as a peripheral rarefying process, which is rare or a central perforating type which is more common in man. In liver lungs, and spleen, it forms tubercle like masses which coalesce to form larger degenerative areas which eventually break down in center In subcutaneous tissues and fascie it forms the typical hard brawny indurated growth which slowly undergoes a softening in the center as granulation tissue degenerates, and if not incised will in time break through the skin leaving a discharging sinus with a dusky bluish discoloration around its margins. A characteristic of the larger sinuses is their tendency to granulation-tissue overgrowth at margins giving them a pouting appearance This is often very marked in appendiceal forms as shown in one of the cases in this series. Ulceration



Fig 4 Actinomycosis of lung with pleural and chest wall involvement as shown by bulging of right chest wall.

is seldom seen unless surgery has been attempted Secondary infection always takes place as soon as opened up, which renders diagnosis very difficult The discharge is seropurulent and contains the typical millet seed bodies known as sulphur bodies These are not always present unless the mass has reached a stage of softening When cut into early, there is often nothing but a small amount of serum and a hard indurated mass of granulations obtained, instead of the expected pus This frequently has led to erroneous diagnoses of malignancy in these cases The sulphur body contains the fungus as a central mass of mycelium surrounded by the characteristic ramate clubbed bodies of the organism It should always be looked for grossly in pus where disease is suspected

CLINICAL COURSE AND SYMPTOMOLOGY

In the cervical and jaw cases there will frequently be a previous history of toothache with subsequent extraction of one or more teeth. On examining the oral cavity dental caries or pyorrhœa are found a painless swelling in the region of the jaw or the neck develops The swelling is usually circumscribed and is often mistaken for an enlarged gland If not incised it usually breaks through the skin in time and discharges the typical seropurulent pus with sulphur bodies If untreated other sinuses form and infection continues to spread into the subcutaneous tissue A constant symptom in jaw cases is trismus Likewise in appendiceal cases psoas spasm develops as soon as the infection burrows posteriorly involving the psoas muscle The patient is never able to straighten his leg completely but keeps the thigh flexed on the abdomen to about ten or fifteen degrees An erroneous diagnosis of tuberculosis of psoas muscle is often made on this account as in one of cases reported here Appendiceal actinomycosis differs in no way from simple appendicitis. It may be acute subacute, or chronic. The surgeon operates and removes the appendix and does not recognize the nature of the infection. In from 2 to 4 weeks an abscess may form either in the incision or at a point elsewhere. The incision is the most common site The surgeon treats the abscess as a late wound infection and when the sinus persists, he suspects that a sponge has been left in the peritoneal cavity and frequently explores and finds nothing but an inflammatory mass

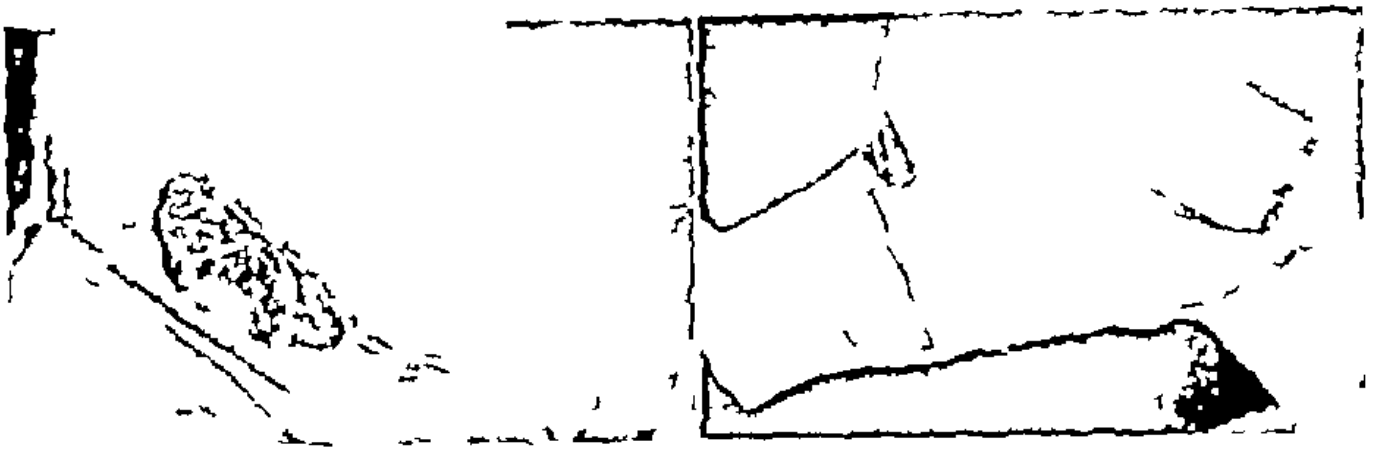


Fig 5 Appendiceal actinomycosis showing typical pouting sinus in old McBurney incision Front and side views

at appendix site This progresses until finally the entire right lower quadrant is filled with an inflammatory mass and a diagnosis of sarcoma is frequently made.

The pulmonary form of actinomycosis is very similar to active tuberculosis lung abscess or if superficial a catarrhal type of affection a simple chronic bronchitis Diagnosis is made by careful and painstaking repeated examinations of the sputum and a roentgenological study of the chest

DIFFERENTIAL DIAGNOSIS

In the cervical region the disease is most often confused with tuberculosis a diagnosis of suppurating tuberculous cervical adenitis frequently being made The chief difference is the fact that this disease does not primarily involve the lymphatics and so soon as the incision is made and no suppurating or necrotic gland is found the surgeon should be on his guard for actinomycosis. In this series of surgical cases two were found to be cases of actinomycosis which 10 years previously had been operated upon at the clinic and tissue diagnosed sarcomatous. It was only by chance in making a routine examination of the old slides for another condition that Dr Broders found the fungus.

In the lung actinomycosis is also often erroneously diagnosed as tuberculosis. A point of difference clinically is that actinomycosis does not begin at the apex Careful sputum examination will as a rule show fungus in the sputum

In the appendiceal region the disease is frequently diagnosed retroperitoneal sarcoma after tumor formation takes place The previous history and associated sinus should put one on his guard for this disease Likewise cases developing psoas spasm will not be diagnosed tuberculosis of the hip if this disease is kept in mind and the discharging sinuses investigated for the fungus.

PROGNOSIS

In neck and jaw cases the prognosis is good Of the 14 cervical and 7 jaw cases in this series 12 reported themselves as entirely cured 7 were improving but not entirely well Skin cases while stubborn eventually clear up under vigorous treatment The form in this series was just as fatal as the appendiceal aside from the rare case of bronchial infection which was still living 20 years after infection took place, though patient was much annoyed by a chronic purulent bronchitis

TREATMENT

This seems to be one disease in which potassium iodide is specific. Heroic doses, however are necessary as even moderate doses do not produce results. The initial dose should not be less than 75 drops of the saturated solution, thrice daily well diluted This may be increased one drop daily until a maximum of 125 or 150 drops three times daily is reached. If symptoms of iodism intervene stop the drug for 3 or 4 days and then resume at the same dosage taken when

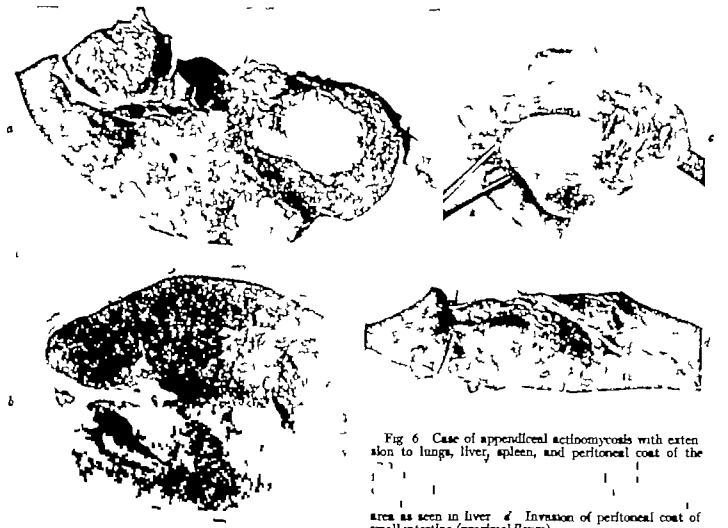


Fig 6 Case of appendiceal actinomycosis with extension to lungs, liver, spleen, and peritoneal coat of the area as seen in liver *d* Invasion of peritoneal coat of small intestine (proximal ileum)

the drug was discontinued By this method cases have taken as high as 150 drops three times a day eventually with excellent results and no untoward symptoms

Surgery is of value only where the tissue involved can be widely excised It was found of value in jaw and neck cases chiefly The involved tissue was widely excised and the wound packed with iodinized gauze and kept open, with the hope of combating the anaerobic tendency of the parasite While the surgical treatment no doubt hastened the cure in most cases I do not believe it essential except where softening and abscess formation has taken place The hard, inflammatory nodules before the stage of softening has been reached respond very well to potassium iodide alone as a rule

A few of the cases were given $^1/_8$ grain copper sulphate, three times a day internally in addition to the iodide of potash There was no noticeable increase in efficiency of the internal medication by this method and the cases given potassium iodide alone did fully as well. Local injections of pure carbolic acid has been reported of value in the literature but were not tried in this series of cases

Radium and X ray have been widely advocated as of value therapeutically In our experience they were of value only as adjuncts to the surgical and medical treatment. Radium hastens the softening of the actinomycotic tissues in cases where the stage of softening has not yet been reached but it does not alone eradicate the parasite. Pulmonary and appendiceal cases were treated with radium and X ray in addition to the internal administration of potassium iodide While it was possible to arrest the disease to a certain extent the cases all proved fatal eventually

Vaccines have been reported as of value but were not tried in this series of cases

Space will not permit my reporting here in detail each of the cases included in this statistical study Since leaving the Mayo Clinic, however it has been my good fortune to have treated four more rather interesting cases of this supposedly rare disease These cases are of special interest in view of the fact that three out of the four had previously been incorrectly diagnosed and were being treated for another condition, which is often the case in this disease

Case 1 R H single, age 26 marine fireman Family history reveals no tuberculosis or malignancy Past history is negative aside from an occasional winter cold In March, 1918 an abscess of the neck was drained In July 1918 the submaxillary glands of the right side of the neck were dissected Patient's chief complaint is discharging sinus of neck In January about a year ago patient first noticed a lump under right jaw Four months previous to this he had had ulcerated teeth which ached almost constantly He had four extracted but the pain continued and 4 months after this a hard nodule developed below the angle of the right jaw Trismus was never present The nodule gradually softened, broke and discharged Patient saw a physician who incised the abscess and said it was possibly a tuberculous gland The sinus persisted and patient saw another physician who diagnosed the disease tuberculous, cervical adenitis and did a submaxillary dissection of right cervical glands The wound never healed completely and

[illegible] No subjective symptoms are now present aside from the discharge

Examination of patient showed a well-nourished adult male who seemed normal physically aside from the following findings Both bicuspids and the anterior two molars were missing in the right lower jaw The rest of the teeth were in fair repair There was an indurated area on the right side of the neck, bluish-red in color the size of a pecan, and with a discharging sinus in the middle An old scar from a previous operation was seen just above.

A small curette was inserted in the sinus and typical "sulphur bodies" in serosanguinous pus flowed from the sinus Microscopic examination showed a typical ray fungus

Under local anesthesia the indurated nodule was freely excised and the wound packed with iodinised gauze Patient was given 75 drops of saturated solution of potassium iodide three times a day the dosage being increased 1 drop daily until a maximum of 110 drops thrice daily was reached By this time the wound had completely healed and to date he has remained entirely well

I was at a loss to account for the source of the infection in view of the fact that patient's occupation was marine fireman However on further questioning he informed me that he had been in the habit of going to the harvest fields of eastern Washington every year for summer employment He said he frequently chewed the raw grain while at work in the fields as he was very fond of it

Case 2 M N K married age 56 farmer store manager Mother died of epithelioma of cheek. No family history of tuberculosis In 1908 patient had appendectomy He treated cow for lumpy jaw 20 years ago One year ago he had an ulcerated tooth extracted He was very fond of raw grain and chewed it frequently while in his store He complained of a cough

The cough began in July 1919 and was dry hacking and became progressively more pronounced He now coughs almost constantly and at times the paroxysms are quite severe The appetite has failed recently he has lost 16 pounds The sputum became blood-streaked after the first month In past few days patient has spit up rather firm nodular masses

Examination showed a sick looking and rather dyspneic man with a harrassing cough Temperature 100 2 pulse 90 Physical examination showed signs of consolidation in the right middle lobe Except for loss of weight there is no other physical signs

Roentgenogram of the chest showed condensation of the middle lobe of the right lung A tentative diagnosis of a typical tuberculosis of the lung had been made Sputum on examination had been reported negative for tuberculosis. Later sputum was examined again and showed the presence of the

history was negative. Patient complained chiefly of swelling and stiffness of the jaw The difficulty began about 6 weeks ago with toothache Patient had been employed as a hostler since his army service began 6 months ago As far as he knows he has not come in contact with horses having chronic ulcers or tumors about the head or neck. He said he was frequently in the habit of chewing raw grain

The swelling was lanced but no pus was found. Poultices have been applied constantly for the past 3 or 4 days. The pain is constant and moderately severe.

Examination showed a well-developed negro who was physically normal except for the following findings. There was a hard, brawny swelling at the angle of the left lower jaw Trismus was such that he could open the jaw only to admit lead pencil between the teeth Slight fluctuation seemed to be present deep in the tissues A probe was inserted in the old incision which caused a free flow of sero-purulent material containing typical sulphur bodies. *Patient was also given large doses of potassium* iodide He left my care before complete cure took place so I am unable to report end-result

CASE 4 W M, married age 29 horseshoer *Family history negative Past history negative* aside from occasional attack of grippe. I saw this

A third operation for exploration and drainage was done April 2 1918 I saw him in May of this same year at which time he had a fixed, firm irregular mass completely filling the right lower quadrant and extending up to the level of the umbilicus. There was marked psoas spasm on the right The right leg could not be straightened beyond an angle of 170 degrees. I obtained the following report from his army record

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lanced and pus evacuated. Surgeon diagnosed it stitch abscess The wound kept draining however, and on February 4 an exploration was performed for possible lost sponge Nothing was found, except *an abundance of adhesions and an indurated scar* tissue at old appendix site An iodoform gauze pack was inserted and the belly closed Drainage continued and on April 2 a third operation was per *formed at which time the sinus tract was excised.* Since this last operation a hard mass has gradually developed which at present fills the entire lower quadrant Two discharging sinuses were present near McBurney's point Six weeks ago there developed stiffness of the right hip which has remained in a constant state of partial flexion on abdomen Patient is gradually losing weight and strength

fungus infection to be present. I was interested in seeing the appendix which had been removed in this case and found upon exploring the tip a concretion the size of a small pea. On section of this concretion a piece of *wheat grain was found in its center* proving without a doubt that this man had been infected directly through swallowing raw grain.

I was transferred to another post before treatment could be instituted so cannot give end result.

CONCLUSIONS

1 There is but one true species of micro-organism capable of producing actinomycosis in man and lower animals and this is the one isolated by Wolff and Israel and later more fully described by Wright

2 There is no convincing clinical evidence supporting the theory that this organism is a normal inhabitant of the oral cavity and gastro-intestinal tract of man

3 There is much clinical and biological evidence that this micro-organism has its source outside of the human body and is capable of a dual existence first as a saprophyte in old sod soil from which it gains access to grains and grasses and through this medium or intermediary host so to speak, it becomes capable of infecting man and lower animals

4 In order for infection to take place two things are necessary first an abrasion of the tissues second the fungus must in some way be brought directly in contact with this abrasion

5 Animal to-man infection is far more common than we have been led to believe it was by earlier investigators

6 Human actinomycosis is not a rare disease, but a disease which is often over looked or incorrectly diagnosed

7 Every inflammatory swelling of chronic or subacute nature with persistent and recurring sinus formation should be carefully investigated for this disease

8 A negative smear on first examination does not rule out infection as the fungus in the presence of mixed infection is often very difficult to find

9 The disease should always be kept in mind in every case of atypical pulmonary tuberculosis and should be looked for in cases suffering with chronic purulent bronchitis or bronchiectasis

10 Early treatment of superficial lesions are highly successful Internal infections are extremely fatal and hopeless

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THE MANAGEMENT OF ACUTE CRANIAL INJURIES BY THE EARLY, EXACT DETERMINATION OF INTRACRANIAL PRESSURE, AND ITS RELIEF BY LUMBAR DRAINAGE[1]

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SURGERY is gradually overcoming obstacles to its employment in the various regions of the body as the advances in our knowledge of anatomy physiology and pathogenesis make the conditions for operation more clear Thus history has shown how in turn the abdomen the chest the joints and the head have been successfully invaded The realm of *acute injuries* of the head, however has been neglected by the surgeon. Advances in our knowledge of physiology and pathogenesis of acute brain lesions have not been utilized and procedures of diagnosis and treatment are today in a stage comparable to those employed for abdominal lesions of 30 years ago

In this paper I shall endeavor to prove the following points regarding acute traumatic injuries of the brain

Pathogenesis The all important finding is that of *increased intracranial tension* due to oedema and hæmorrhage of the brain causing interference with the paths of absorption of the cerebrospinal fluid If not relieved early the increased pressure leads to chronic morbid changes in the cortex of the brain or in extreme cases, to death.

Symptoms The symptoms usually depended on for indications to surgical interference such as slow pulse high blood pressure and stertorous respiration are *late* symptoms and are due to *medullary* pressure. Surgery is of little avail if one waits until the medulla is involved

Diagnosis The early diagnosis of increased intracranial tension can be easily and directly made by estimating the pressure of the cerebrospinal fluid by the mercury manometer connected with the hollow needle inserted as for lumbar puncture. This increased pressure antedates the appearance of the secondary symptoms of medullary pressure by many hours.

Treatment The relief of intracranial pressure can be obtained early and safely by repeated lumbar drainage The relief so obtained prevents medullary compression and the symptoms usually looked upon as indications for operation do not appear

Subtemporal decompression (supratentorial) does not adequately relieve pressure on the medulla (subtentorial) but lumbar drainage does relieve pressure on the medulla and suffices to prevent death when the concomitant hæmorrhage and oedema of the brain has time to subside the normal circulation of the cerebrospinal fluid is re established

Realizing that the dicta cited above are somewhat revolutionary and are not in accord with present-day usage I shall present

[1] A report of experimental work done in the Department of Surgery Northwestern University Medical School and Cook County Hospital in conjunction with Prof F C Becht of the Department of Pharmacology Northwestern University Medical School
Read before the Chicago Surgical Society April, 1917

was done at Northwestern University in conjunction with Professor F C Becht)

HISTORICAL

Our data of the anatomy and physiology of the cerebrospinal fluid system are of comparatively recent acquisition and considerable yet remains to be discovered

Eighty years ago, Majendie (1) discovered, in the roof of the fourth ventricle, the minute opening that bears his name and pointed out the connection between the cerebrospinal fluid in the ventricular system and that in the subarachnoid spaces of the brain and cord By this epochal discovery he led the way to a correct understanding of the circulation of the cerebrospinal fluid and to problems associated with increased intracranial tension Thirty five years ago Corning (3), an American, tapped for the first time, this cerebrospinal water bed by inserting a needle between the last two spinous processes of the dorsal vertebræ, for the purpose of anæsthetizing the cord Thirty years ago Wynter (4) drained the spinal system for tuberculous meningitis It is to Quincke (5), however that we owe our greatest knowledge of lumbar puncture and intracranial tension In 1891 he published his studies on the diagnostic and therapeutic application of lumbar puncture and his work stands, after 30 years, as a perfect elucidation of the pathogenesis of lesions that affect the cerebrospinal fluid system Quincke made it a rule always to *measure the pressure* of the cerebrospinal fluid by connecting the lumbar puncture needle with a fine glass pipette in which the fluid was allowed to rise He found the normal pressure to be between 90 and 120 millimeters of water Recently Weed (2) has shown how the cerebrospinal fluid finds its way from the foramina of Majendie and Luschka, through the subarachnoid spaces over the cortex of the brain to be absorbed mainly by the arachnoidal villi along the sinuses, especially the longitudinal sinus I have found that any swelling or œdema of the cortex of the brain due to injury arrests the circulation of the cerebrospinal fluid and raises intracranial tension, *ultimately endangering the medulla and* floor of the fourth ventricle Since Quincke's time a great amount of work has been done upon the acute and chronic forms of increased intracranial tension—such as occurs in hydrocephalus, brain tumors, uræmia, alcoholism, and the acute and chronic forms of meningitis But the field of *acute traumatic injuries* has been neglected by the surgeon In 90 per cent of the cases of acute cranial injuries—where there is subdural hæmorrhage or œdema—the patients are now treated expectantly by ice cap, catharsis, morphine, etc Nothing accurately is determined as to intracranial pressure during their stay in the hospital or after leaving Should they develop the late symptoms of medullary compression they are operated upon but too late for any hope of a successful outcome

This state of affairs is partly to be explained by the work of Cushing (6) and others whose experiments seem to prove that the general blood pressure is an accurate index to intracranial tension Following their line of thought, cases of brain injury are treated expectantly in practically all hospitals and no operative interference is called for until the general blood pressure reaches 170 or more and the pulse becomes slowed to 60 or less No effort is made to determine the intracranial pressure by *direct* estimations, partly because the pulse, eye-ground and general blood-pressure findings are relied upon and partly because it is considered dangerous to perform lumbar puncture I shall show by cases of my own and from reports of others that both these dicta are not to be relied upon for acute cranial injuries, that general blood pressure is low for many hours, due to shock, and that its rise is so slow in the cases that might be saved by operative interference that when it does occur, it is too late a finding to be of service The danger of lumbar puncture in these acute traumatic cases has been greatly overestimated Practically all of the sudden deaths following lumbar drainage have been in cases of chronic tension due to tumors especially those below the tentorium cerebelli

The technique of the exact determination of intracranial tension by the manometer has never been standardized. There has been

a lack of uniformity in reading results and in type of instrument used Therefore the procedure had fallen into disuse until Landon (7) sometime assistant to Frazier in 1917 described a method of accurately determining the intracranial tension by a mercurial manometer and drew the attention of the profession to its importance in both medical and surgical conditions He did not publish his results however by series of cases and little more was heard of the procedure until Sharpe (8) published his work last year on *Acute Brain Injuries* Sharpe for the past 3 years following Landon s technique has based his indications for operation on the state of the intracranial tension as determined by lumbar puncture manometric readings, and by the examination of the eye grounds If the tension rises above 16 millimeters of mercury and the eye-grounds show beginning oedema he performs a subtemporal decompression He records results of a large series of cases

Since my return from the Army I have been estimating the intracranial pressure in all my cases at the County Hospital and in private practice and present my results of a series of upward of 100 cases herewith

Up to the present time the status of our management of acute cranial injuries is well outlined by Besley (9) who in 1916 analyzed 1000 cases of fracture of the skull He states that

> The signs of general intracranial pressure produced by bleeding or oedema are usually present as manifested by unconsciousness, slow pulse, embarrassed respiration, high blood pressure, choked

no means free from danger especially in those cases in which there is a marked increased intracranial pressure The danger is that, with the relief of pressure within the spinal canal, the medulla and pons may be forced into the foramen magnum and constricted sufficiently to cause immediate death Therefore it is not our routine practice to do spinal puncture in all cases It is not done if the diagnosis can be made certain from other signs and symptoms This procedure is reserved for that class of cases in which a patient is picked up on the street in coma and remains unconscious with no obtainable history of injury If a positive diagnosis is not arrived at from other evidence a spinal puncture is done.

He then goes on to state It is surprising how infrequently the pulse rate is slow The average is 96 in all cases in only 65 of 1000 cases was the average below 70

Furthermore, the respiration fails to show a striking characteristic change There is vomiting in only 36 per cent. Vaughan (10) moreover has shown how little reliance can be placed on eye-ground changes in traumatic cases Papilloedema is a late finding in intracranial tension I have never been able to show an increase in general blood pressure early in these cases In fact the patients are in shock for many hours after their accidents, with a rapid pulse and lowered blood pressure

Rawling (11) in a study of cerebral oedema during the war states that blood pressure is affected but little William Sharpe states that the high intracranial pressure necessary to raise the general blood pressure to any appreciable extent must reach a very dangerous state of compression in these acute cases before its effects can be observed in an increased blood pressure I feel therefore that the blood pressure as an important aid in the treatment of brain injuries has been much over emphasized I might add that similar objections can be brought against the other symptoms and signs of acute intracranial tension If therefore the symptoms and signs of increased intracranial tension, as increased blood pressure slow pulse, vomiting eye-ground changes of papilloedema sterterous respiration, etc. are *delayed* evidences of intracranial tension that come on slowly and *indirectly* by pressure on the medulla, and are influenced by other factors such as shock and hemorrhage and result often in blindness or death is it not better to estimate the pressure early and directly before these dangerous symptoms arise? Especially so if the procedure is not fraught with danger Granting for the moment that it would be dangerous to withdraw fluid in very high intracranial pressure, it is possible by a simple apparatus to estimate this pressure without the loss of a single drop of fluid by directly attaching the manometer to the

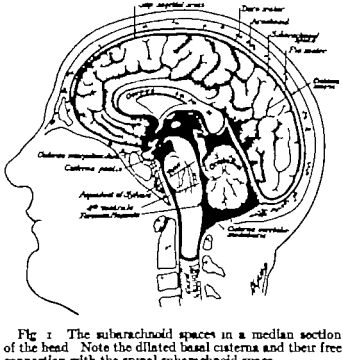


Fig 1 The subarachnoid spaces in a median section of the head Note the dilated basal cisterna and their free connection with the spinal subarachnoid space.

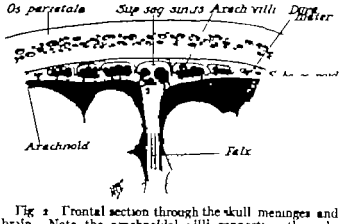


Fig 2 Frontal section through the skull meninges and brain Note the arachnoidal villi connecting the subarachnoid space with the dural sinus (Modified from Key and Retzius)

spinal needle Kroenig (12) states that if the fluid pulsates it is in direct connection with the brain and fluid can be withdrawn without danger If the pressure is high that is all we need to know It may be from hæmorrhage or œdema the indications are the same Relieve this pressure by lumbar drainage and prevent papilloedema and pressure on the medulla. I do not agree, however, that the procedure is dangerous in the acute traumatic cases. This is an error that has crept into our calculations from results with cases of chronic tension especially in tumor cases of the base of the brain

Schoenbeck (13) in a recent review of deaths following lumbar drainage collected 71 cases and in 67 found by autopsy there was tumor or other chronic disease of the brain Gumprecht (14) in 1900 collected 17 cases of sudden death following lumbar drainage and autopsy showed them to be caused by pressure of tumor Many of these were punctured in the sitting position and 15 to 60 cubic centimeters of fluid was with drawn at one time The accidents are due to pressure on the medulla by the walls of the foramen magnum and hæmorrhage from the tumors because of sudden release of tension on their vessels. The latter accident can also occur in decompression operations with sudden release of tension On the other hand I or my assistants have done upward of 300 lumbar punctures in acute injuries to the head within the last year without untoward symptoms Our patients are all in the horizontal position and usually not more than 10 to 20 cubic centimeters is slowly removed at one time

Sharpe (15) has done 1100 lumbar punc tures in the last 3 years with these precautions without a death Kaliski (16) reports one death in over 10 years of this work and states that this could not be definitely attributed to the lumbar puncture So I believe that we must take a different attitude toward these acute traumatic cases than we entertain toward the chronic cases where there is con siderable molding of the brain by long-continued pressure

In fact Kahler (17) is so impressed with this view that in a recent study he has tried to find some other factors responsible for deaths in cases of chronic cranial hypertension His findings are that there is a rise of general blood pressure after lumbar puncture in cases of cerebral disease that may account for their sudden exitus In those acute traumatic cases I have examined the general blood pressure falls slightly immediately after lumbar puncture and would suggest lessened danger from that source Kahler believes that estimation of the blood pressure before and after lumbar puncture is of considerable diagnostic significance in differentiating dis ease of the brain from other conditions and can be used as a guide for the removal of fluid

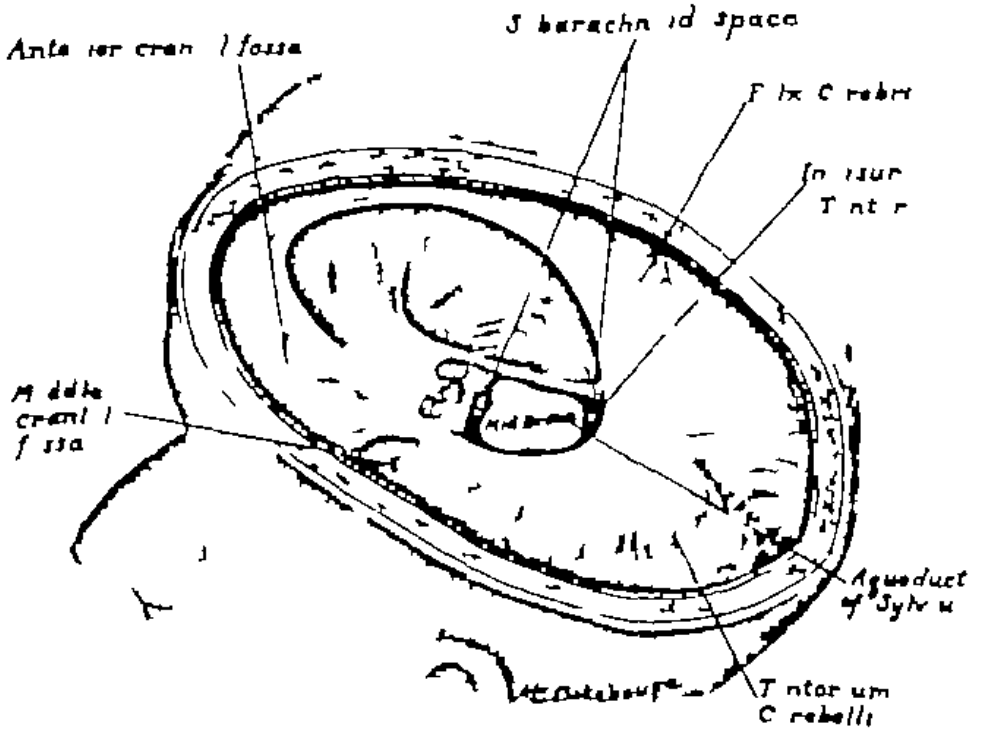


Fig 3 Original drawing from a dissection of the skull at Northwestern University

ANATOMY AND PHYSIOLOGY

In order to understand the advantages that may be gained by lumbar puncture, it is necessary to have freshly in our minds the anatomy of the cerebrospinal water bed The cerebrospinal fluid is probably secreted in the ventricles by the choroid plexus The lateral ventricles normally contain about 30 cubic centimeters The fluid finds its way from the lateral ventricles through the foramina of Monro to the third ventricle thence along the aqueduct of Sylvius to the fourth ventricle

In the roof of the fourth ventricle posteriorly is the foramen of Majendie and in each lateral recess the foramen of Luschka through which the fluid escapes to the large cisterns beneath the arachnoid These reservoirs have been named by Toldt according to their location There are cisterns of the sylvian fissure optic chiasm interpeduncular space pons, cerebellomedullary region and great vein of Galen They contain normally about 60 cubic centimeters of fluid but in pathological states may contain two to three times this amount Another 30 to 60 cubic centimeters is present in the spinal portion The fluid rises through the incisura tentorii to be distributed over the cortex of the cerebrum Thus is constantly being absorbed mostly by the arachnoidal villi into the dural sinuses when there is no obstruction to its circulation The total amount is renewed, as some believe several times during the day serving to dilute and carry off the metabolic waste products of the brain

The cerebral and spinal subarachnoid systems are freely connected with each other as was first demonstrated by Key and Retzius (18) This allows artificial drainage of the cerebral subarachnoid water bed by the spinal route

The circulation of the cerebrospinal system has always been rather vaguely described and surgeons generally have overlooked its importance While some have realized the

importance of relieving the increased pressure of the cerebrospinal fluid its metabolic function of carrying off waste matter has not been emphasized The fluid after leaving the foramina of exit in the fourth ventricle finds its way upward from the basal cisterns through the narrow subarachnoid space of the incisura tentorii (Fig 3) to the surface of the cerebrum, where it is absorbed for the most part into the dural sinuses and arachnoidal villi scattered over the surface of the brain A slight swelling or hæmorrhage of the cerebrum or midbrain blocks the cerebral subarachnoid spaces and the fluid cannot be absorbed along its natural channels The fluid no longer rises above the tentorium but collects in the basal cisterns and in the ventricles and stasis results The enlargement of the basal cisterns forces the midbrain up and occludes further the narrow subarachnoid spaces in the incisura tentorii The enlargement of the lateral ventricles above the tentorium forces the cortex of the brain still more against the dura and unless the excess of fluid is withdrawn from below the tentorium, a dry and flattened cortex is found at autopsy The medulla suffers from the direct pressure of the fluid in the basal cisterns which gives evidence by symptoms of vomiting, bradycardia, high blood pressure, and stertorous respiration

Thus, we see a vicious circle set up—impeding the absorption of cerebrospinal fluid more and more until the resultant pressure rises so high that death results

PATHOGENESIS

The tension of the cerebrospinal fluid may be increased in traumatic cases by a number of factors restricting the space usually occupied by cerebrospinal fluid

1 Any depression of the skull, especially depressed skull fractures

2 Hæmorrhage extradural—as in middle meningeal or sinus rupture

3 Subdural hæmorrhage

4 Subarachnoid hæmorrhage or œdema

5 Subpial hæmorrhage or œdema,

6 Intracerebral cerebellar or spinal hæmorrhage or œdema,

7 Ventricular hemorrhage

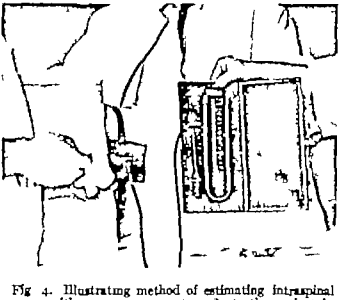
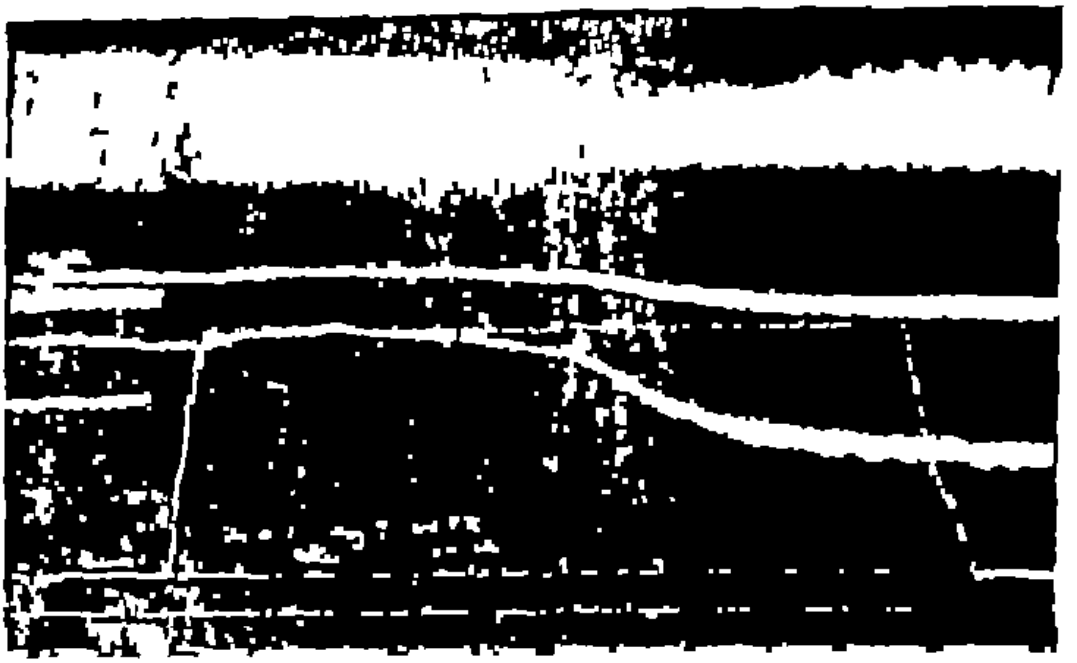


Fig 4. Illustrating method of estimating intraspinal pressure with mercury manometer Note the patient in horizontal position, needle in fourth lumbar interspace and height of mercury column level with spine.

8 Increased secretion or decreased absorption of cerebrospinal fluid

In depression of the skull and extradural hæmorrhages the pressure is usually localized *and it is quite obvious that these conditions* must be relieved locally by raising the depression and ligating the bleeding vessel. In the great majority of cases the other factors mentioned above come into play, the brain is pressed against the dura more or less, generally preventing the cerebrospinal fluid from reaching the arachnoidal villi to be absorbed The secretion of fluid within the ventricles continues however, so that within a short time, depending upon the extent of the cerebral œdema the accumulation of fluid is so great at the base of the brain that the floor of the fourth ventricle and the medulla is endangered The cerebral œdema sets up a vicious circle by cutting off the paths along which the cerebrospinal fluid is absorbed This allows of a dilatation of the basal cisterns pushing up the mid brain and blocking the isthmus of the tentorium cerebelli This may explain the high pressures I have found after subtemporal decompression where the reading was taken by lumbar puncture Le Count, in a review of the pathological lesions present after skull injury found the brain pressed against the dura and the subarachnoid water bed non-existent. The normal cisterns of the sulci were obliter

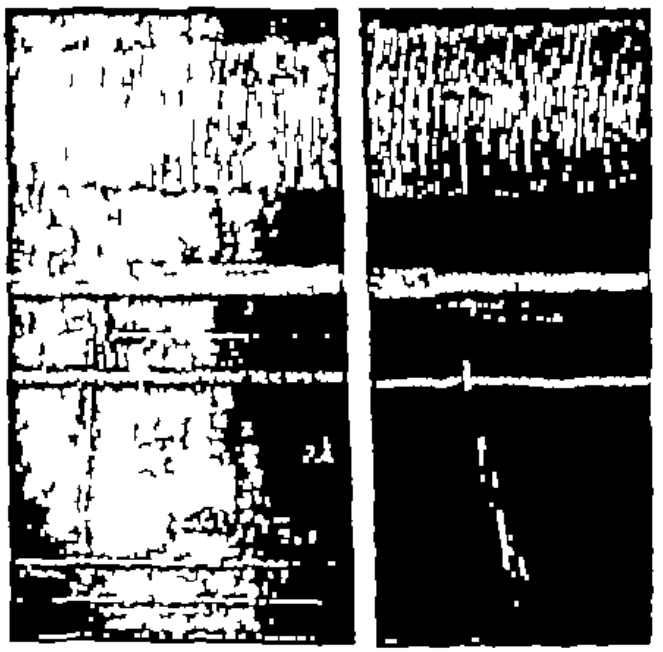


Graph Intracranial pressure applied over medulla Note primary stimulation f respiration a light rise in blood pressure with the heart rate practically unaffected Later a decrease in respiration and fall in blood pressure and a marked slowing of the heart rat Lastly a return to normal when pressure is released

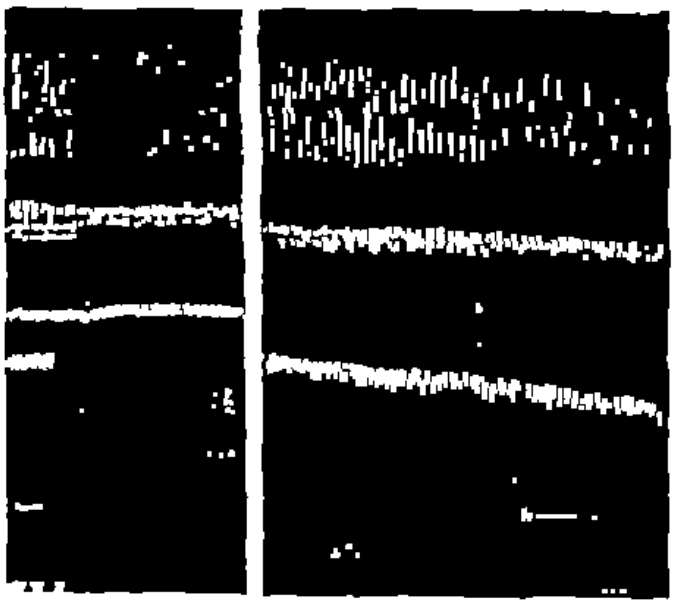
ated Drainage above the tentorium is of little avail in these cases It is my opinion that relief here can be obtained much better from below by lumbar puncture than by suboccipital or subtemporal decompression

PATHOLOGY

Le Count (19) in an analysis of 547 cases of skull fracture that came to autopsy out of 908 cases collected from the records of the Cook County Hospital between 1911 and 1918 summarizes the chief pathological lesions as follows



Graph 2 Pressure applied above the tentorium There is no change in respiration, blood pressure or heart rate



Graph 3 A repetition of the experiment shown in Graph 1 with identical results

Twenty per cent are extradural hæmorrhages resulting from rupture of the middle meningeal artery—of these 63 per cent were not recognized clinically and of the 37 per cent recognized and operated on only 11 were saved, making the mortality of this condition 89 per cent.

In 95 per cent of all fractures there were subdural injuries These consisted of subarachnoid or subpial hæmorrhages with a maximum of 100 grams of blood, the average being 40 grams and only 1 to 10 grams in 40 per cent of the cases The subarachnoid hæmorrhage was due to bruises of the brain and rupture of the leptomeningeal vessels. The subpial hæmorrhage was from tears of subpial arteries These were not so extensive as the subarachnoid hæmorrhages It is quite evident that a considerable proportion of this blood can be removed by lumbar drainage.

The most frequent change in the brain found in persons dying from fracture of the skull was *traumatic œdema* Here the convolutions were found flattened suggesting *pressure of brain against dura and skull* and the *disappearance of the subarachnoid water-bed* The cerebral vessels were empty and flattened suggesting an anæmia of the cortex. The peripheral ends of the sulci were closed—obliterating the normal cisterns of cerebrospinal fluid The fluid in the leptomeninges was lessened and the visceral layer of the arachnoid almost dry when the dura was first removed Then sweating occurred in the form of minute droplets on its surface

Certain conclusions of great value from the standpoint of treatment may be drawn from these postmortem findings.

First, the almost constant finding of brain injury with hæmorrhage and œdema This causes a swelling of the brain and restricts the size of the cerebrospinal spaces even to obliteration in severe cases There can be no absorption of cerebrospinal fluid by the usual routes and with continued secretion of fluid within the ventricles there is added to the pressure created by blood clot and swollen brain that of unabsorbed cerebrospinal fluid in the basal cisterns This increased pressure in the unexpandable cranial cavity is transmitted to the fluid in the spinal canal and can be measured by a mercury manometer attached to the lumbar puncture needle We have in this way an accurate measure of pressure variation within the cerebrospinal system For the actual destruction of brain tissue by trauma there is no remedy We must, however, prevent any further destruction of the delicate brain cells by immediate relief of the pressure anæmia caused by the œdema and hæmorrhage

Second There is a simple method of relieving this increased pressure and of drawing off the effused blood Through the direct connection of the spinal subarachnoid water bed with the basal cisterns and ventricles a needle inserted in the lumbar regions can relieve the pressure to any degree by measurement with the mercury manometer

The only other logical method would be by suboccipital decompression—which is mutilating and unnecessary Subtemporal decompression, as Cushing advises, does not afford relief to the medulla

Third The present classification of brain injuries into concussion, contusion and compression is illogical A better classification from the standpoint of surgical treatment should be based on *compression* alone, or better stated, increased intracranial tension as there is very little of any true compression of the brain.

SYMPTOMS

The only sign of any value, early, is that of the cerebrospinal fluid tension as determined by the mercury manometer, and the presence of blood in the fluid Confirmatory would be the evidences of fracture by the X ray Paralyses indicate the localization of the lesion

The symptoms usually relied upon—the slow pulse embarrassed respiration, vomiting and high blood pressure—are symptoms of medullary compression, endangering life and appearing too late for successful surgical interference Papilloedema also appears late.

Quincke (20) in 1905 after many years of observation on the cerebrospinal fluid pressure draws the following conclusions regarding symptoms

In acute brain injuries, the general symptoms often fail us Moreover in determining the *grade* of hypertension in acute injuries the general symptoms often fail us It is in these cases that the *estimation of the cerebrospinal fluid pressure* is of most importance and the best results gotten by lumbar drainage Acute serous meningitis, after concussion of the brain often leads to chronic serous meningitis if not relieved Chronic head aches intolerance to alcohol and neurasthenic symptoms often follow concussion with unrelieved hypertension"

It is only by the estimation of the pressure by the mercury manometer that one can make the diagnosis We must realize that the slow pulse embarrassed respiration, high blood pressure choked disc and vomiting are not the early signs and symptoms of increased intracranial pressure in the surgical sense but are signs and symptoms of medullary compression, and it must be made very plain that once the medulla is endangered—the chances for life are very small indeed

There is only one sure way of estimating increased intracranial tension before the medulla is affected by transmission of the pressure—and that is directly with the manometer

symptom
still prid

blood pressure by palpation of the radial artery? Who neglects today the use of the mercurial manometer in the exact estimation of blood pressure? Why then, should our attitude toward cerebrospinal fluid pressure be any different? There are those who still count the drops per minute of the exuding spinal fluid or who measure the height with the eye to which the fluid spurts The brain unlike the heart or the abdominal contents is a very delicate organ and withstands trauma but poorly It is all the more important, therefore that this organ be spared as much as possible long continued pressure Watchful expectancy in cranial insult is criminal. The early and exact estimation of this deadly pressure and its early relief if present to a harmful degree should be our primal consideration The surgical measures for this relief are at our hands and they should be executed in suitable cases as soon as possible Theoretically blood clot may so obstruct the cerebrospinal system that a spinal pressure reading may not be obtainable I have never found this to be true in any of my cases neither have I seen recurrence of cranial hæmorrhage after lumbar drainage

DIAGNOSIS

Twenty per cent of the cases of head injury that come to autopsy present middle meningeal hæmorrhage which show an increasing pressure on the spinal water bed with clear fluid—unless there is concomitant dural injury in which case the fluid may be bloody In subdural cases seen early the diagnosis of brain injury—that is hæmorrhage and œdema — is made by repeated lumbar puncture—with the finding of blood and an increased tension of the cerebrospinal fluid. The presence or absence of linear fracture is of secondary importance The general symptoms of slow pulse embarrassed respiration, increased blood pressure papilloedema and unconsciousness appear later if the increased tension is not relieved They need not appear at all if tension is kept within normal limits by lumbar drainage Focal symptoms help to localize the lesion of the brain

PROGNOSIS

Variations in the manometric readings are the best guide to prognosis. Increasing pressures show that the lesion is progressing unfavorably Decreasing pressures indicate a favorable outcome. Continued increased pressure indicates chronic hypertension, which if not relieved leads to symptoms usually classified as traumatic neurosis but are really evidences of a gliosis of the cortex.

TREATMENT

The expectant policy of most hospitals in acute brain injury has been superseded in my service at the Cook County Hospital by the following routine

1 An examination of the head to determine site of injury and to rule out depressed fracture—first by inspection and direct palpation and later by X-ray

2 Routine lumbar puncture Take pulse and blood pressure b[illegible]

cerebrospinal fluid, determining the fall in pressure by special stopcock arrangement of needle attached to mercury manometer, and stop withdrawing fluid when pressure has been reduced one-half or to normal If pressure reading is high and no blood is present in fluid, suspect middle meningeal hæmorrhage without rupture of dura

Technique Have patient on right or left side in *horizontal plane* and on an *unyielding* surface, with spine flexed—if necessary in a restless patient give a preliminary hypodermic of morphine or gas anæsthesia. Surgically cleanse area of fourth lumbar interspace and insert needle in mid line Withdraw stilet and as soon as cerebrospinal fluid appears, connect needle with mercury manometer held by assistant at level of spine and take reading Then open side arm and collect cerebrospinal fluid in graduated sterile test tube Shut off fluid when 10 to 20 cubic centimeters is collected or when pressure reaches normal withdraw spinal needle and seal with collodion

Description of instrument The instrument is a simple U tube with side arm made for me by Mueller & Company Attached to the side arm is a rubber tube which connects readily with the lumen of the needle by a metal sleeve The needle is 1 millimeter bore and has a horizontal stopcock which allows withdrawal of cerebrospinal fluid without disconnecting the manometer so that one can see the fall in mercury column while withdrawing fluid

3 Treat shock by usual methods

4 Repeat lumbar puncture at intervals of 6 to 24 hours or longer, depending on height of pressure and rapidity with which pressure rises after withdrawal of fluid

5 Other routine examination of the eye grounds, reflexes, pulse, temperature, respiration, etc. to complete physical examination

6 Keep patient in bed for 4 weeks in severe cases and take pressure reading before patient leaves the hospital to rule out any tendency to chronic hypertension.

In the non fatal cases only those are tabulated where fairly complete records had been kept.

In all cases the blood pressure has been taken on successive days, both before and after lumbar puncture It is usually between 100 and 150 systolic—low while the patient is in shock and slowly rising to what appears to be normal for the individual In no cases of the series except one has it exceeded 170 systolic In only 8 cases was it above 150 In 28 cases it was below 130 In those cases that showed a systolic pressure over 150, the patients entered after an interval or there was chronic hypertension due to systemic causes

I have recorded the lowest pulse record on the accompanying charts In 28 per cent of the cases, the pulse was below 60 In 50 per cent, the pulse was above 70 There seemed to be no slowing of the pulse or increase in blood pressure in those cases where the cerebrospinal fluid pressure is kept low by repeated lumbar drainage

The eye-grounds were examined in most of the cases and in only three of the series was there papilloedema The absence of papilloedema in most of the cases also was due to the repeated tappings of cerebrospinal fluid The three that showed papill œdema were cases coming into the hospital several days after injury

The cerebrospinal fluid pressure was above 30 millimeters mercury in 14 per cent the highest reading being 60 millimeters In 34 per cent, the pressure was between 20 and 30 millimeters In 44 per cent, the pressures varied between 10 and 20 millimeters of mercury In the fatal cases the pressure with in the spinal canal varied between 12 and 60 millimeters The mortality rate has been decreased from 50 to 25 per cent. A report on morbidity will be made after a sufficient interval has elapsed to be of value.

An analysis of our cases show that they fall into four general groups

First, there are those cases of very severe crushing injuries of the head with medullary injury that succumb within a very few hours or at most 24 hours With these very little can be done medically or surgically, and they constitute in this series of cases 13 3 per cent of the total number The cerebrospinal fluid pressure varies between 12 millimeters and 60 millimeters of mercury

ACUTE BRAIN INJURIES—SEVERE CASES

Case	Age	Injury produced by	Pulse	Symptoms	Blood pressure mm.	Cerebro-spinal fluid pressure mm.	Amount withdrawn cc.	Pressure after ward mm.	Fluid	Result
J. A.	21	Automobile	60	Coma, 3 days		70	10	8	Bloody	Recovery
							5	6	Yellow	
A. C.	28	Automobile	68	Coma	118–72		10	7	Bloody	Recovery
			84			8	5	8		
S. D.	64	Fell over railing	74	Coma. Bleeding from nose		8	10	8	Bloody	
			80			4	10	6		
								6		Recovery
J. H.		Fell from truck	44	Coma. Later vomiting	68–80 after ward	20	5	8	Bloody	
			78			14		6		Recovery
					30–80	9	5	6		
T. H.	52	Drunken brawl	60	Contusion. Lacerated scalp	80–86	6	10	4	Bloody	Recovery
			70		2–78					
F. D.	54	Motorcycle	80	Contusion, for week	164–118	60	30	7	Bloody	
	[illegible] day 8th d.		00	Fracture, left parietal region. Headache	30–130	40	7	5	Bloody	
	8th d.		80	Talks intelligently	148–112	30	30	6	Clear	
	11th d.		70	Rational, no headache	142–120		5	6	Clear	Recovery
J. I.	23	Fell down stairs	62	Coma. Bleeding from right ear	80–72	7	10	10	Bloody	Improved
							10	0		
A. C.	40	Automobile	52	Coma. Bleeding nose and ear	120–70	12	20		Bloody	
						16	20	8		
L. M.	42	Auto truck	90	Coma. Paralysis right side of face. Head ache	5–82	40	20–30	10	Clear	Improved
			80			80	6	8	Clear	
						14	Later	6	Clear	
C. S.	36	Freight car	54	Contusion	30–90	28	5	16	Bloody	Recovery (4 weeks)
			78	Headaches		24	20	14	Bloody	
			96			14	10	10	Clear	
D.	8	Auto-truck	10	Coma. Paralysis right side. Loss of memory. Irritability	84–34	30	5	18	Bloody	Paralysis clearing. Memory regained
					82–78	22	5	14	Cloudy	
					88–98	8	20	6	Clear	
C. F.	30	Slugged	70	Coma. Meningismus. Headaches	35–62	80	10	9	Bloody	Mentality clear
			80		104–65	6	10	7	Bloody	
								6	Clear	Recovery
E. B.	3 yrs. 4 d.	Auto	88	X-ray. Transverse Fracture frontal bone. Unconscious. Laceration of scalp. Vomiting	104–44	30	10	8	Bloody in 3 tubes	
	4th d.		60 after puncture		110–80 after puncture	6			Blood tinged	Improved
	6th d.		82		70–70					
			80		110–80			4	Slightly tinged	Recovery
C. B.	42 yrs. 10 days after injury	Auto	100	Coma, 2 days, blood from mouth	106–70 after puncture 14–66	22	5	6	Clear	Recovery
			Pulse 84 after puncture	Discoloration behind right ear. headaches		8	20	6		
M.	30	Fell downstairs	120 then	Temperature 103	90–80 then 30–70	12	5	7	Clear	Recovered from head injury. Died later of pyæmic abscess
G. M.	20	Riding motor cycle and collided with auto	68	Unconscious one hour	98–90	6	5		Clear	Recovery
F. H.			68		138–90					
			84 then		112–60 after	18		6	Bloody	Recovery
			86		114–60		5	6		
A. E.	38	Found on R. R. tracks 12 days before	80	Paralysis of ex rect of eye	90–84	18	5	8	Clear	Psychopathic
	42		80		140–80	16	10	7		
			90	Laceration of scalp concussion. Acute alcoholism	90–90	10	5	4		
			98		90–90					
F. S.	38		100	Laceration of scalp concussion	86–46	6	4		Clear	Recovery
			100		86–46					

ACUTE BRAIN INJURIES—SEVERE CASES—*Continued*

Case	Age	Injury produced by	Pulse	Symptoms	Blood pressure mm.	Cerebro-spinal fluid pressure mm	Amount with drawn c cm	Pressure after ward mm	Fluid	Result
S F	25	Fall off roof of moving train	68	Laceration of scalp bleeding from nose	150–70	22	20	6	Bloody	
	1st d				174–70					
	14th d		80		130–80	40	15	18		
			thers 96		132–80					
	17th d		100		150–78	22	35	9		
			100		108–66					
	18th d.		Slight temperature	Decompression per formed						
	19th d.		102		135–70	3	80	6		Discharged recovered
			90		98–70	14		6		
H. K.	60	Shot herself through frontal lobe	84	Unconsciousness Decompression operation Ligated right middle meningeal artery drained subdural region	190–65	15	30	3	Bloody Clear	Recovery
					140–95	8				
E W	25	Fall from wagon striking back of head	72	Headache Drowsiness Unconsciousness Temperature 103 Mentality clear no headache	156–1 3	13	8	5	Bloody	Recovery
			84							
			76							Recovery
M. Z.	20	Struck on front of head with club	48	Restless Stup skull fracture Comatose Beginning papilloedema, conscious.	180–90	36	15	18	Bloody	
			56			18	1	10	Slightly bloody	
		2 days later	72	headache	148–80	65	80	6	Yellow	
		10 days after injury	76	Mind clear no headache		30	5	1	Clear	Improving
		20th day	80							
			72			1	5	7	Clear	Recovery
J O'C	53	Blow on head with club	96	Aphasia Laceration of scalp (left)	158–88	8	5	2	Clear	
	1st d.									
	2nd d		84	X-ray shows linear fracture left parietal bone Paresis of right arm Talks a few words	158–88	4	20	4	Bloody in 3 tubes	
			60							
	5th d.		72	Slight headache	164–94	18	15	6	Bloody	
	8th d.		78							
			70	Returning use of hand Temperature 1 F		2	10	6	Yellow	Recovery
	8th d.		70							
S H	65	Auto?	80	Fracture right parietal bone Convulsions.	40–75		5		Bloody	
			60	Bleeding from right ear Irrational	76–90 250–78					Recovery
C. B	40	Street car	00	Coma. Ecchymosis left eye. Left hemiplegia	118–72	90	30	10	Slightly bloody	Psychopathic
	1st d.		88			1		4		
	2nd d		60							
	3rd d.		5							
J O.	23	Auto	80	Stuporous	5–75	16	5		Bloody	Recovery
O S	50	Found on sidewalk	80	Lacerated left eyebrow Stuporous 3 days	35–70	0	5	6	Bloody	Recovery
W R	63	Auto	100	Unconscious	90–50	5	1	5	Clear	
	1st d		60	X-ray negative		23	0	6	Bloody	
	4th d.		72	Aphasia		13	5	6	Bloody	
	7th d		00	Right pupil small						
	9th d		80	Ecchymosis right eye		15	1	6	Yellow	
	23th d.		7	Clear mentally		5	1	0	Clear	
	25th d		70	Speech returning			5	7	Clear	Recovery
M S	3	Auto	120–100	Laceration of scalp Skull fractured	0–60	18	7	8	Bloody	Recovery
W B	6	?	90	Skull fractured	114–60	23		10	Bloody	Recovery
			10			14		6		
F d M	33	Street car	7	Coma 17 days	130–70	20	20	10	Bloody	
	1st d			Bleeding from nose, mouth and left ear.						
	2nd d.		60		130–70	4	30	12	Bloody	
	3rd d.		56	X-ray showed fracture left parietal	5–78	28	30	14	Bloody	
	6th d.		68			18	20	8	Yellow	
	11th d.		72	Mentality clearing	1 3–75	8	1	5	Clear	
	18th d		7		1 3–75	7	5	5	Clear	
	24th d.		7	Good condition	1 3–75	7				Recovery
C G	60	Fall from wagon	72	Comatose, Bleeding from nose Headache	198–85		20	6	Bloody	
	1st d.		80		160– 00		20	6	Yellow	
	3rd d		64	X-ray shows fracture of right parietal bone		8	5	8	Clear	Recovery
	6th d		78							
	13th d.									

ACUTE BRAIN INJURIES—MILD CASES

Case	Age	Injury caused by	Pulse	Symptoms	Blood pressure	Cerebrospinal fluid pressure mm	Fluid	Result
J S	65	Fall from street car	60	Coma		10	Clear	Recovered left hospital third day
W W	28	Fall in front of auto skidded	108	Coma		8	Clear	Recovered left second day
T S	29	Fall from auto	90	Stuporous		8	Clear	Recovered left second day

CHRONIC OR CONTINUED HYPERTENSION

J K	57	Jack striking head	84	Headache Dizziness Vomiting	170–70	9	Clear	Recovered 30 c.c. removed Symptoms relieved
J W	37	Axe striking head	7	Headaches Inability to work, depressed skull fractured		8	Clear	Unimproved

FATAL CASES

Case	Age	Injury produced by	Pulse	Symptoms	Blood pressure mm	Cerebrospinal fluid pressure mm	Amount withdrawn cm	Pressure after withdrawal mm	Fluid	Result
?	?	Skull fracture	120	Coma Bleeding left ear	?	3	10	3	Bloody	Death 6 hours
T S	3	Fall out of fourth story window		Fractured skull	?	3	?	?	Bloody	Death in 24 hours
H R	3	Hit on head with rock	58	Coma Hemorrhage from left ear and nose	160–80	16	10	4	Bloody	Death in 5 days
M R	30		120	Coma Lacerated scalp Hemorrhage left ear	90	10	3		Bloody	Death in 24 hours
F J	30	Fall downstairs	7	Coma Skull fracture, temperature 105 Exophthalmos Rt lateral hemiplegia	98	10	3	6	Bloody	Decompression Operation Death in 18 hours
H S	60	Fall backward after slight spell One week before entrance	66	Coma One week Skull fracture Chronic nephritis	195–110	40	30	14	Yellow	
	2nd day 4th day		64	Continuous Headache	200–120	60	20	7	Yellow	Death
F F	30		58	Coma Pupils unequal Exophthalmos	160–84		20	0	Bloody	Died hours after entrance
F A	30	Street car	82 120	Comatose Delirium tremens	98–80 178–7	12	20	6		Died of oedema of lungs

Second, there are those cases rather common of mild injury to the brain with unconsciousness—that show a normal or slightly increased cerebrospinal fluid pressure up to 12 millimeters and the absence of blood in the spinal fluid. These recover in 24 to 72 hours as a rule. Occasionally one of them continues to have symptoms of headache dizziness, and general symptoms of neurasthenia and develops a serous meningitis with increased intracranial tension These are usually relieved by the repeated withdrawal of small amounts of cerebrospinal fluid. They constitute 26 6 per cent of the cases and there were no deaths.

Third there are those cases of moderately severe cranial injury with or without skull fracture but with contusion of the brain There is blood in the spinal fluid and the pressure is increased beyond 12 and up to 22 millimeters of mercury that is 2 or 3 times the normal pressure There may be focal symptoms of paralysis of the extremities or of the face or injury of the cranial nerves. The reflexes are altered. The temperature usually is increased and the coma or con-

vulsions persist for several days It is here one's careful judgment comes into play It is with this class of cases that I have achieved good results by carefully and slowly withdrawing from 10 to 20 cubic centimeters of fluid at intervals of 12 to 24 hours always watching the pressure of the cerebrospinal fluid so that it is decreased not more than one-half Whether or not I am justified in this procedure, time alone can tell The immediate results have been satisfactory Sharpe advises subtemporal decompression in pressures over 16 millimeters I believe this is not necessary These constituted 42 2 per cent of the cases The mortality in this group was 3 per cent

The fourth class are those very severe injuries of the brain usually associated with skull fracture that show a cerebrospinal fluid pressure over 22 millimeters Usually between 22 and 30 millimeters and sometimes as high as 40 millimeters Here, a subtemporal decompression usually has been done And yet, I am not convinced that subtemporal decompression does as much as lumbar drainage They constitute 20 per cent of the total number and the death rate was 6 per cent, making a total death rate for the whole series of less than 25 per cent.

EXPERIMENTS

The following experiments were undertaken to determine the effects of pressure applied to the brain above and below the tentorium cerebelli My thanks are due Prof F C Becht of the Department of Pharmacology of Northwestern University Medical School for his kind co-operation.

In conducting these experiments on animals we recorded the blood pressure from the carotid artery, heart rate from the femoral vein and respiration from the side tumor in the respiratory tambour A hole was drilled through the arch of the atlas and the dura incised so that the pressure could be applied directly to the medulla A similar hole was drilled in the parieto-occipital region Each hole was closed by screwing into it a brass tube Both tubes were connected by means of a T piece with a pressure reservoir filled with warm physiological salt solution Clamps were adjusted so that pressure could be applied at will either over the medulla or over the temporoparietal region

Graph 1 is a tracing secured from an animal weighing 9 kilos under ether anæsthesia The top record is the respiration, the second shows the heart rate, the third the carotid blood pressure and the fourth the intracranial pressure The lines at the bottom represent the signal and base lines of the graph As can be seen from these tracings pressure applied over the medulla produces, first, a stimulation of respiration and a slight rise in blood pressure with the heart rate remaining practically unaffected Second there is a decrease in respiration and fall in blood pressure and a marked slowing of the heart rate, changes which return practically to the normal when the pressure is released

Graph 2 is a second tracing from the same animal in which pressure was applied to the brain in the temporoparietal region The pressure applied is exactly the same as that applied in the tracing No 1, but there is no change either in respiration, blood pressure, or heart rate

Graph 3 is a repetition of the experiment shown in Tracing No 1 and the results are practically identical there being first a slight rise in blood pressure, no change in heart rate and a slight stimulation of respiration followed by a decrease in respiration and slowing in heart rate and a falling in blood pressure This graph shows that the failure of the change to appear in Tracing No 2 is due to the difference in the application of the pressure and not to a decrease in the activity of the central nervous system

These three graphs show clearly that the slowing of the heart rate and the change in blood pressure is a phenomenon of medullary compression, and therefore are likely to be a late manifestation of skull fracture where the injury lies in the central nervous system cephalad to the tentorium cerebelli

CONCLUSIONS

The following conclusions may reasonably be deduced from observation of the clinical cases and from the experimental work on dogs.

1 In most acute injuries of the brain the cerebrospinal fluid pressure is a fair index as to the severity of the lesion. Dependable prognosis can be made by any increase or decrease of this pressure.

2 A new clinical classification of injuries of the brain based upon cerebrospinal fluid pressure alone as shown by the mercury manometer is superior to the accepted classification of concussion, contusion, and compression.

3 The pathogenesis of acute injuries of the brain demonstrates that the principal effect of the oedema of the brain and hæmorrhage is to interfere with the absorption of cerebrospinal fluid by the usual paths this sets up a vicious circle causing further pressure on the brain by the accumulating fluid in the basal cisterns below the tentorium cerebelli and in the lateral ventricles which presses the brain upward against the dura and produces cortical anæmia. The cortical anæmia if unrelieved, quickly leads to gliosis causing lasting changes in the character disposition, and mentality of the patient, if he recovers from the brain injury

4 The relief of the increased pressure on the brain and the re-establishment of the normal path of absorption of the cerebrospinal fluid can be obtained by repeated lumbar drainage—which in acute injury cases is absolutely without danger

5. Lumbar drainage is superior to subtemporal decompression in relieving pressure below the tentorium cerebelli and has the further advantage that it leaves no mutilating skull defect The use of concentrated salt solutions intravenously lowers cerebrospinal tension but does not remove blood

6. Experiments upon dogs producing pressure on the cerebrum and on the medulla, show that the pulse, respiration, and blood pressure are affected only when the medulla is compressed. Therefore to wait for these changes as an indication for operation on the cerebrum in acute cranial injury is to court disaster

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AN ANALYSIS OF THE END-RESULTS IN TWO HUNDRED THIRTY-TWO HYSTEROMYOMECTOMIES

WITH SPECIAL REFERENCE TO OVARIAN CONSERVATION

BY JOHN G CLARK M.D., F.A.C.S., AND CHARLES C. NORRIS M.D., F.A.C.S PHILADELPHIA

THE following is an analysis presenting the end results obtained in a series of 232 patients upon whom supravaginal hysteromyomectomy was performed The study was undertaken in the hope of shedding some light upon the fate of conserved ovaries, in cases in which hysterectomy was necessary and upon the ultimate comfort of such patients as compared with those from whom both ovaries had been removed It is unnecessary here to consider in detail the many arguments for and against ovarian conservation in this class of patients It has been asserted that conserved ovaries are likely to undergo cystic degeneration and give rise to pain, that they do not functionate, and, at best, that their life is ephemeral, that every conserved ovary is a potential factor for subsequent trouble, and that, in general, better results can be obtained by routine excision of these organs.

In our study only those cases in which the myoma was the principal pathological lesion were included, no patients who had passed the menopause at the time of operation being considered Of the 232 cases studied, both ovaries were conserved in 90, 81 had one ovary removed, and in 61 a bilateral oophorectomy had been performed Obviously patients who had recently been operated upon could not supply the desired information. For this reason only such cases as had been operated upon at least one year previously were utilized

A questionnaire was sent to 374 patients A considerable proportion could not be traced, as many of the patients had been operated on 5, 10, or even 13 or more years before About 20 per cent of the patients included in this report have been interviewed personally and examined A point to be noted is that the results obtained by the latter method are more favorable to ovarian conservation than are those obtained by the questionnaire. Patients will frequently answer one or more questions in a questionnaire in the negative because they attribute the symptoms from which they suffer to the operation or to the pelvic lesion, when in fact, they are due to entirely different causes Thus, in answer to a written inquiry a patient may state that her general health is poor a statement that may be true. Her poor health, however, may be due to a cardiac, renal, or other lesion entirely foreign to the condition that necessitated the operation.

In an investigation dealing with so complex a problem as the menopause, it is extremely difficult to formulate a questionnaire that will cover all points satisfactorily Under such circumstances it is impossible, in many instances, correctly to interpret the cause of the symptoms and to determine with certainty whether they are due to the menopause or to some other condition

This is exemplified by our inquiry regarding nervousness. Many patients answered this question in the affirmative but it is evident that this symptom may be due to a variety of conditions, and is undoubtedly present in a considerable percentage of women who have never suffered from a pelvic lesion

Nearly every symptom from which a woman may suffer as the result of an artificial menopause produced by a surgical operation may, if considered singly, be accounted for by conditions other than that of castration. It is only by a study of the combined symptoms—noting their time of onset in relation to the operation, their severity, and many other points—that a satisfactory conclusion can be arrived at.

The fact that the age at which the menopause occurs in the normal woman varies and that it also differs markedly in severity in different individuals, adds materially to the difficulty in framing a questionnaire

such as ours. At the time of operation many of
at whic
occur
have occurred in a definite proportion of the cases, in the interval between the operation and the receipt of the questionnaire even if no operation had been performed For similar reasons a certain percentage of women would probably state that during this period they had suffered more or less severely from the menopause even if no operation had been necessary The personal equation also enters largely into the character of the answers obtained *thus some patients will* complain greatly of a symptom that another will practically ignore These *and other sources of* error should be taken into consideration in the study of these cases

The effect of bilateral oophorectomy upon the sexual life of the woman is an important factor This subject cannot be determined satisfactorily as the result of a questionnaire and has not been referred to in our inquiry Among the patients whom it has seemed feasible to question upon this point, quite divergent results have been found to exist Viewed in the aggregate and excluding certain perhaps exceptional cases the results have been very decidedly in favor of ovarian conservation The arresting of the sexual life the senile changes, such as atrophy drying etc that take place in the vagina, *have been notably absent* in those patients upon whom ovarian conservation has been *practised Atrophic changes* in the vagina occur with such regularity following bilateral oophorectomy *that we have made it a rule* not to perform plastic operations for minor degrees of laceration upon *patients in whom* the removal of both ovaries is necessary These conditions and occasionally a mental attitude of inferiority or degradation due to the patient s belief that she is unsexed or in this respect senile have been encountered in a certain number of patients in whom both ovaries have been excised

Three important conclusions have been arrived at, namely (1) That excellent end results may be obtained by performing hysteromyomectomy whether or not ovarian conservation is practised (2) that the severity of symptoms occurring at the menopause is dependent more upon the patient s individual temperament than upon her age, and lastly (3) that conserved ovaries rarely give rise to trouble

That excellent results may follow hysteromyomectomy whether or not the ovaries are conserved is well known and is amply borne out by the fact that over 99 5 per cent of all our cases studied stated that they were either cured or improved by the operation

Of the 212 patients who answered the question regarding their general health, only 2 stated that it was poor and the family physician of one of these patients informed us that the ill health of his patient was due clearly *to an advanced* cardiac lesion. This patient had been operated upon 12 years *previously and no symptoms* referable to the pelvis have occurred since the operation No information *regarding the condition* of the other patient could be obtained.

The statement *previously made that* the severity of symptoms attending the surgical menopause is dependent *more upon the* temperament of the patient than upon her age is difficult to prove by a statistical study *It* has, however been one of the most striking features of our investigation, and particularly emphasized in those patients who have been personally interviewed

We have observed instances in which a bilateral oophorectomy has been performed upon young women, often still in their twenties, in whom although the menopause *has* occurred the attendant symptoms have been mild and given rise to little or no *trouble. On the other hand* some of the most severe cases have occurred in women *past 40 or 45 years* of age. Unfortunately even after a close study of the individual patient has been *made, it is* sometimes impossible to forecast just how troublesome the surgical menopause will be *in her case. As* a general rule, the highly strung nervous or neurotic individual suffers most, *whereas the* phlegmatic asexual woman will experience little discomfort. Women differ markedly *in* this respect.

Reference has previously been made to the fact that the conserved ovary may undergo degenerative changes, and thus give rise to various distressing symptoms that may make a second operation necessary This point has been emphasized by some operators, who therefore, recommend that a bilateral oophorectomy be performed whenever removal of the uterus becomes necessary Our own experience does not bear out this finding We firmly believe that too much stress has been laid on this point.

In the present series of 232 patients ovarian conservation was practised upon 171 cases (in 90 cases both ovaries were conserved and in 81 an unilateral oophorectomy was performed) and 261 ovaries were spared In not a single case was a second operation for the removal of the conserved ovary required These figures furnish strong arguments for ovarian conservation for if the retained ovary gives rise to no further symptoms its removal cannot be recommended Even granting that this series of cases may have been particularly fortunate in this respect, the evidence would certainly go to prove that the proportion of conserved ovaries that give rise to subsequent trouble is not great. We are firmly convinced that in patients who have not passed the menopause the ovary is a most important organ, and should not be removed unnecessarily

We believe that successful ovarian conservation is largely dependent upon three factors

1 *The ability of the surgeon to judge the condition of the ovary in situ* It is plainly unwise to spare an ovary that is the seat of disease that will continue to progress after the uterus has been removed Thus a severely inflamed ovary, or one the seat of a neoplasm should be removed, whereas an ovary that merely presents a few adhesions, but that is otherwise normal, should be spared It is only by considering the individual patient, and by careful correlation of the symptoms and the pathological process that is present that accurate conclusions can be arrived at. An important guide in this respect is the amount of pain the patient has suffered prior to operation Marked pain in the region of the ovary or severe dysmenorrhœa, particularly of the ovarian type, is an indication for oophorectomy Every operator should familiarize himself with the macroscopic and microscopic pathological changes that occur in the ovary Without laboratory study no surgeon is capable of judging pathological conditions *in situ* and this is of the greatest importance in deciding whether or not to practise conservation in any given case

2 *The maintenance of an adequate blood supply for the conserved ovary* This is of the utmost importance If the character of the operation is such as materially to injure the blood supply of the ovary conservation of the organ is hazardous, and subsequent trouble is prone to occur The blood supply is less likely to be impaired if the fallopian tube is also conserved In dealing with myomatous tumors of the uterus, this is usually a feasible procedure. In about one-third of all myomata that come to operation, the adnexa are inflamed, but the inflammatory process is more likely to be confined to one side than in either the gonococcal or the tuberculous varieties of salpingitis, and for this reason in the majority of cases at least one normal tube and ovary are present. By practising conservation of the corresponding fallopian tube not only is a better blood supply secured for the ovary, but a more rapid and neater operation can be performed

3 *The maintenance of the ovary in good position after operation* If the conserved ovary is allowed to prolapse into Douglas cul-de-sac or is twisted upon its pedicle in an attempt to suspend it, the blood supply is interfered with and painful symptoms are likely to develop

It should be remembered that good results can undoubtedly be obtained by performing hysteromyomectomy with ablation of both ovaries and for this reason a diseased ovary, or one in which the blood supply has obviously been interfered with, had best be removed This, however is not the condition that is present in the majority of these cases. It is our belief that in the average case there is no excuse for the removal of normal ovaries

CONCLUSIONS

1 Hysteromyomectomy is productive of excellent end-results whether or not ovarian conservation is practised Of all patients in our series over 99 5 per cent were cured or improved and over 83 per cent declared that their general health was good or improved one year or more after operation

2 Better end results and greater comfort to the patient can be secured as the result of ovarian conservation

3 Everything being equal better end results follow the conservation of both ovaries than the retention of one but one ovary is far better than none

4. Conserved ovaries seldom give subsequent trouble Among 171 cases in which *ovarian conservation was practised 261* ovaries were conserved and in none of these patients was a second operation for the removal of the ovary necessary This is a strong argument in favor of ovarian conservation in this class of cases, for if the conserved ovary does not give trouble there can be no excuse for its removal

5 That conserved ovaries may give subsequent trouble is conceded as is also the fact that the series of cases quoted may have been unusually fortunate in this respect Successful ovarian conservation depends upon the condition of the ovary at the time of operation the maintenance of an adequate blood supply and the retention of the ovary in its normal position

6 We believe that undue emphasis has been placed upon the frequency of cystic and other forms of degeneration in conserved ovaries and that attention to the points just mentioned will largely abrogate such disturbances

7 Bearing in mind the fact that good results can be secured by performing bilateral oophorectomy it is often better to sacrifice a doubtful ovary than to spare it. This is a point, however on which each case must be judged individually

8 When both ovaries are removed, the surgical menopause is by no means severe In all cases, those patients who suffer unduly being in the minority

9 The age of the patient is not an unfailing criterion as to the severity of the surgical menopause in any given case Young women will sometimes bear the loss of both ovaries well whereas some of the most severe phenomena of the surgical menopause encountered in this series have occurred in patients past 40 years of age This does not imply that the age is an unimportant factor in considering the question of ovarian conservation. Other things being equal, there is no doubt but that younger women suffer more severely as a result of a bilateral oophorectomy than do those who are older

10 A more important guide than the age, however is the temperament of the individual patient The highly strung neurotic woman is likely to suffer more severely than her more phlegmatic, asexual sister

11 Each case should be individualized The temperament of the patient should be studied and a correlation of this with history and the pathological process found at operation should determine the type of operation to be performed

12 Conserved ovaries functionate

13 Even in those patients in whom the ovary does not functionate permanently the occurrence of the surgical menopause is less abrupt and severe than in those women upon whom a bilateral oophorectomy has been performed Among the former class of cases the artificial menopause generally resembles the normal menopause more closely than does that following the removal of both ovaries.

RELATIONSHIP BETWEEN HISTOLOGICAL STRUCTURE AND BIOLOGICAL ACTIVENESS OF GOITER TISSUE[1]

By F DE QUERVAIN M.D F.A.C.S (Hon) BERNE SWITZERLAND

UNTIL the end of the past century goiter was regarded as an entity in etiological research and no attention was paid to the histological structure of the gland in the individual case Through the research work of Greenfield, Haemig, Askanazy, L R Mueller, and others, through our own investigation on thyroiditis, and since 1910, through the work of Kocher and Howald, Plummer, Wilson, special cell changes have been noted in the goiter of Graves' disease, proving that the cell changes in the different types of goiter should be given due consideration

In 1905 Aeschbacher, working under my direction, pointed out that results obtained could be interpreted only by means of combined chemical and histological investigation He studied the material in our clinic, noting the relationship between the histology and the iodine and phosphorus content of the thyroid gland The most extensive work in this direction has been done by Oswald and Plummer

When biological methods began to be employed in studying thyroid function, there followed a demand for research work combining physiopathology and histology Graham was the pioneer in this work He tested the effects on tadpoles of the iodine contained in adenomatous tissue and normal tissue and found that with adenomatous tissue it was the same but less pronounced than with normal tissue In either case it seemed to depend upon the amount of iodine in the tissue On the other hand he was unable to determine a constant relationship between the physiological effect of the tumor substance, the percentage of iodine contained and the histological character Graham confined his research to adenomata Wegelin and Abelin went farther They investigated the biological effect on tadpoles and normal thyroid tissue and of thyroid tissue of different histological structures, from patients of different ages, also determining the amount of iodine the tissue contained They came to the conclusion that the effect of struma diffusa especially in its colloid form, and also of adenomatous goiter, resembles largely in many cases the effect produced by normal gland, with the exception of struma neonatorum which, as a rule, contains no iodine and has no specific effect

This proves that growths which must be characterized as real tumors contain substances corresponding biologically to those in normal gland But it has not been proved as the authors themselves emphasize that these substances are beneficial to the body Neither do these experiments inform us in what quantity the substances enter into the circulation of the blood Furthermore as has been shown by Gley, substances which have been obtained experimentally from a gland may not, without reserve be identified with the secretion of the gland

We therefore decided to make a further investigation of our cases examining by means of the same biological method as used before, not only goitrous tissue but also venous blood from the thyroid gland and at the same time blood from any other large vein belonging to the systemic circulation, for instance from a vein in the arm These experiments were conducted in our laboratory by Dr Hara. He used principally common goiter and the goiter of cretins

Let me state here that the study of thyroid gland tissue and of blood by means of a biological method (Laewen-Trendelenburg method) has hitherto been made only once and then by Dr Eiger at the Physiological Institute in Berne His work covered seven cases of Graves' disease and two of common goiter, without considering the histological structure of the struma.

We did not use the thyroid tadpole and Laewen Trendelenburg methods, but used a method worked out under the direction of Professor Asher by Dr Streuli and Dr Duran

[1] Presented before the Clinical Congress, October 19 1.

2 The injection of *serum from thyroid veins* produced in all cases a positive reaction but less strong than did thyroid feeding The order of succession was the same The blood from veins of common goiters is distinctly more active than that of cretin goiters

3 *Blood from the arm veins* is distinctly active in the cases of colloid goiter and parenchymatous enlargement but on the other hand not distinctly in cases of adenomatous goiters neither from noncretins nor from cretins

4 In three out of four cases of dwarf cretins with *thyroid atrophy* (without goiter) the *blood from the arm* produced a decrease in the sensitiveness to lack of oxygen

DISCUSSION OF RESULTS

We are not surprised at the great activity of the tissue from exophthalmic cases. The histological examination showed in all cases definite colloid contents It is possible that the cases of exophthalmic goiter with less colloid would be less active than nontoxic colloid goiter

It is obvious that the common struma diffusa colloides and parenchymatosa of noncretins i.e of individuals in a condition of eu-thyroidism, has about the same effect as the normal thyroid glands, as it plays the same part in the human organism Seeing that in this case also glands deficient in colloid are sometimes almost as effective as glands rich in colloid we must assume with Graham, Wegelin and Abelin, that not only is colloid active, but that gland substance deficient in or without any colloid may contain much active substance.

It is eminently interesting that cretin strumas such as occur in the worst cases of cretinism are biologically active even after every bit of nonadenomatous tissue has been removed

The effectiveness of goiter substance does not, by any means, prove that its secretion is

emphasize first that in the thyroid vein blood of every type of common struma the presence of active substance could be proved biologically With the establishment of this fact one of the most important postulates of endocrinological research has been fulfilled Of still greater importance is the fact that its activity can be proved, even if only in a very slight degree in cases of highly developed cretinism.

Whether this effectiveness is due to the remnants of atrophic thyroid gland substance present in most cretins or to adenomata, we can not directly decide If however, we consider the positive results of feeding with adenomata taken from cretins, the histological

might furnish active substances.

Certain facts in the endocrinology of cretins suggest that the active substance furnished by adenomata is not identical with the normal thyroid secretion. There is an outspoken dissociation of the main symptoms of cretinism

dwarfism, and on the other hand very marked in cretins with goiters and without dwarfism There is no parallel, indeed, between mental and skeletal disturbances.

These facts may be explained easily by the assumption that adenomata are able to furnish an active substance showing either absolutely abnormal qualities (absolute dysthyroidism) or abnormal proportions of the normal components of the thyroid secretions (relative dysthyroidisms)

One of the most important facts resulting from our researches is the establishment of a *biological effect of arm vein blood derived from patients with common goiter* in contrast to the arm blood of non goitrous people Should these results be further confirmed they would serve to demonstrate that the common goiter produces substances which are not destroyed in the small or large circulations and which

and found no activity either in the arm vein blood of persons affected with Graves dis-

ease, or in that of patients with common struma Further experiments will throw light on this point.

Theoretically it would be very important if the results pertaining to the action on rats of blood from arm veins of non goitrous cretins namely a *decreased* sensitiveness to lack of oxygen, could be confirmed These results would tend to show that the thyroid gland possesses besides a stimulating action an antitoxic one

Our researches are on the point of being completed by the study of the iodine and thyroxin action on cretins and by the comparison of the rat test with the tadpole test and basal metabolism

It seems to me that the study of cretinism is equally as important in investigating the functions of the thyroid gland as the study of the exophthalmic goiter and that the rat test might be, in conjunction with the clinical and histological research, a valuable help toward the solving of the pending problems, especially in regard to the behavior of the blood and to biological activeness of the different types of goiter tissue

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ACUTE PULMONARY ŒDEMA IN LABOR

By FREDERICK G CORBIN M D C M Mendoza Argentine Republic

TWENTY FIVE years' practice and a search through textbooks and journals have not revealed a case similar to the one reported below I feel justified, therefore, in presenting this report of a case of acute pulmonary œdema in labor for the consideration of my distinguished colleagues in this congress[1] of medicine

Mrs. A D deS, age, 24 of German parents married 7 years of good social position father, mother sisters and two brothers all living and well does not remember being sick in her life She had had one child 2 years after marriage Labor was normal the child strong and healthy and never has been sick.

In the month of June 1915 I was asked to attend patient in confinement in the city of Godoy Cruz Mendoza. I was told that she had a good midwife and a competent German nurse and that only in case of unexpected complications would I have any thing to do

tient in my consulting room I must confess that, as I had known her for some 17 years I did not make an examination simply talked with her about her pregnancy and as the urine was pronounced normal, I assured her that there was nothing to do but to wait with patience and not to change in any way her mode of living

About the last of August I was called urgently and found the midwife in attendance. The midwife assured me that there was nothing — that the patient had had pains the night before but that these had ceased and there was no dilation of the uterine cervix On examination I found this to be true and that the position of the child was normal. An analysis for albumin was made the following day with negative result

One month later at 7 a m on September 27 I was called again arriving in company with the trained nurse about 8 a m The midwife told us that she had been called at 6 had found dilation that the position was left occipito-anterior and everything quite normal Trusting this diagnosis I did not even wash my hands, but sat down beside the patient and began to talk with her and advised her not to make so much voluntary effort as the involuntary forces were sufficient In spite of this she persisted in making voluntary efforts to expel the child but I do not think they were more than others use in the same conditions

A few minutes after my arrival a fine 3 kilo male child was born a few minutes later the placenta was normally expelled without abnormal hæmorrhage After congratulations I retired with the husband to the sitting room leaving in the hands of the nurse and midwife the care and cleanliness of my patient On retiring from the bedroom not a single thing gave me even a remote idea of what was about to occur

In about 10 minutes I was called by the nurse who said that the patient was very gravely ill Her state was truly alarming her general appearance gave one the idea of imminent death from asphyxia her pale face covered with perspiration her cyanotic lips, her nostrils dilating with each inspiration her anxious expression and feeble almost imperceptible voice all asked for air

As can be imagined the moment was not propitious for counting respirations, while her pulse was

[1] National Medical Congress Buenos Aires, 916.

seventy five they must have been about fifty The inco-ordination between pulse and respiration especially attracted my attention I at once sat her up in bed and found on auscultation vesicular respiration and innumerable crepitant and sub-crepitant râles throughout both lungs while per cussion was normal

Diagnosis acute pulmonary œdema

While preparing an injection of morphine I ordered my two assistants to apply hot turpentine stupes to her chest and back Her state was so bad that in spite of using boiling water and a good dose of the revulsive she apparently did not notice it Five minutes after I had entered the room she had received 1 centigrammes of morphine hypoder matically administered and in another 5 she began to cough at short intervals while with each attack she brought up a mouthful of a frothy bloody liq uid In the next half hour she had coughed up 700 grammes of this liquid and at the end of an hour this measured more than a litre

This expectoration which at first was decidedly bloody became rose colored and finally clear and crystalline The pulse reached 100 and my patient was saved In the afternoon the pulse was 90 no râles to be heard An analysis of urine next day showed it to be normal She got up 10 days after and nursed her son for over a year Up to date she has never been sick

This is the history of my patient and now let us say something of her disease

I searched the literature for information Spanish French, or English could give me more than the following

In the *Manual of Medicine* published by Debove and Achard 1896 is an article by M Parmentier which mentions acute and general congestions of the lungs and on page 190 gives among the causes *des grande ef forts surtout cenx de l accouchment* —this is all Did M Parmentier wish to signify an acute pulmonary œdema? I do not think so because on page 196 he admirably de scribes an acute œdema and says it occurs in the gouty arthritics and Bright s disease and does not mention pregnancy or labor as a cause Through the kindness of a colleague I was able to read the thesis of Dr E Centenaro presented in 1908 before the Medical Faculty of the University of Buenos Aires *Accidentes pulmonares durante el embarazo* (Pulmonary Accidents during Pregnancy) The paper is very interesting surely but it refers to œdemata *not in labor* but before and caused by different intoxications

Among the causes of this terrible disease in the absence of renal hepatic cardiac in fectious disease or medical intoxications, Albert cites Purely mechanical causes and I believe that my case was produced by spasm of the left ventricle (Huchard) Grossman says that it may be caused by a perturbation of the innervation cardiopul monary and as a consequence of this a rapid insufficiency of the right ventricle

In my case it is impossible to attribute the attack to either the left or the right cardiac cavity but it was undoubtedly due to a spasm or cramp of one or the other as in spite of careful examination of heart, kidneys and other organs no disease could be found and again because had it been due to an intoxica tion as in the cases cited by Dr Centenaro the injection of morphine far from curing would have made the patient worse

Twenty years ago in Carmen de Patagones I saw an old woman who suffered from aortic disease with attacks of acute œdema She experienced immediate relief and cure with a single injection of morphine with atropin The treatment with morphine is very much discussed and while some authors consider it the most appropriate others think that bleeding stimulants strychnine camphor ated oil, adrenalin, etc. are better Some (Faisans in Robins 1912) even condemn the use of opium in any form This is easily explained because the causes of acute œdema of the lungs are multiple and varied Robins (1912) cites a long list of causes My belief is that as far as treatment goes one should take only two causes into consideration in toxication and heart trouble These really include all the causes given by authors I do not believe that an œdema, produced by intoxication, whatever may be the cause— whether it be faulty elimination of urea (renal) bile (hepatic) microbes (infectious disease) or poisons, etc —requires different treatment the result is the same namely toxic bodies circulating in the blood What should be done? Certainly morphine should not be given I believe that bleeding and

replacing the blood with physiological serum intravenously is indicated The bleeding eliminates the poison and the serum dilutes it, while in such cases strychnine, caffein, and other stimulants will help the elimination by natural channels, and at the same time sustain the vital forces

Let us now examine œdema produced by cardiac trouble — spasm or cramp of the ventricles as Grossman and Huchard describe The logical thing in these cases would be to give a dose of morphine and the illogical an injection of strychnine The first ought to calm the spasm while the second might even produce it.

Apparently no one author has had opportunities to treat cases produced by more than one order of causes, as no one in speaking of the treatment has distinguished between œdema produced by intoxications and those caused by cardiac disease with the result that some insist that the proper treatment is strychnine and others that it is morphine The first criticizes the second and vice versa My opinion is that as the cause in my case was cardiac (cramp) and not toxic, the correct treatment was morphine and it would have been better still if it had been associated with atropin

This case and the old woman of Patagones to whom I briefly referred with the same symptoms, treatment, and immediate results although different as far as the provoking cause, are the only cases I have seen and to tell the truth have no desire to see others

I reported my case in a paper in Spanish at the National Medical Congress in Buenos Aires 1916, where it was discussed At that time no one could recall a similar case

As my patient again became pregnant and suffered attacks of œdema, finally succumbing to them, I feel inclined to publish the whole history

Every few months from 1915 to 1920 I saw my patient and often examined her heart I sent her to specialists in Buenos Aires and had both urine and blood examined several times. The Wassermann tests were negative No one found anything pathological.

In 1919 she had influenza with severe congestion of lungs but no œdema.

In July 1920 her husband came to consult me "

might be and advised him to take her to Buenos Aires and consult the highest authority there saying that I would be pleased to help in any way He did so and consulted several professors showing them my address to the medical congress One and all pronounced her perfectly healthy and laughed at the idea of future attacks or any danger After a little over a month she came back bringing with her some tonic injections to be given by me intravenously I never saw the prescription but believed them to have been *Enesol*

Fortnightly I had her urine analyzed and carefully examined her heart and blood pressure She was very well through September and October pulse between 90 and 100 while her blood pressure was from 90 to 110 milligrams mercury Nothing abnormal was found in heart sounds Only one thing was to be noted—a persistent and very great *fear* of an attack as before. She always insisted she would die in her labor No one could *look* in better health

In November she had her first attack after sleeping quietly for an hour she awoke with dyspnœa I was sent for at once and gave her an injection of one centigram of morphine with 0 5 milligram of atropin The relief was immediate. She coughed up some 200 grams of rose-colored liquid and in 2 hours she was all right getting up the next day without a sign of anything wrong Her pulse when I arrived was 90 with blood pressure 120 and the next morning 100 with 105 milligrams mercury She was now between 6 and 7 months pregnant urine normal.

The question of producing premature labor was discussed but as the effect of the morphine injections had been so good we decided to wait I was fortunate enough to get Miss Ana M Rabinovitz a clever girl student in her last year of medicine who had already passed her examinations in obstetrics and installed her in my patient's house December 12 The following day Miss R. brought patient to my office where I carefully examined the thorax radioscopically and took a roentgenogram of the same. Later the plate was sent to specialists who also declared it normal

Up to this date she had had two attacks more or less the same both after sleeping quietly for an hour or more, both relieved at once by the same treatment At midnight again on the 14th she had another attack, which was relieved by the same injection administered by Miss R When I arrived half an hour later my patient was still coughing and expelling bloody and frothy liquid but was better In another hour she was apparently well. Pulse next morning from 90 to 100 as in health Temperature 36 C. Blood pressure 85 milligrams mercury I prescribed 10 drops of digitalin daily for 5 days and on the 21st her blood pressure was 110

with urine normal Every 4 or 5 days she would

planning of preparation Miss K gave her at her own request only a quarter centigram of morphine with atropin On examining her lungs and finding fine rales all through them, with pulse 120 she gave her another quarter say 5 minutes later In about 10

which the patient gave us to understand were making her worse, were soon suspended About 3 a m Dr Day of Mendoza arrived in consultation and later we tried oxygen and stimulants but without any effect about 4 o'clock she became unconscious For hours she had been coughing and expectorating mouthfuls of rose-colored fluid which finally drowned her From mouth and nostrils this bloody froth continued to flow at each expiration It was impossible to calculate the amount of liquid as from the first she insisted on using a handkerchief or towel Judging from the amount expelled in her attack in 1915 it must have been at least 2 litres

She died at 6 a m the heart beating a few minutes after respiration ceased An autopsy was not allowed In a similar case I would certainly produce an abortion at 1 or 2 months

What was the cause of the pulmonary œdema? I believe cramp or spasm of one of the heart cavities

I will conclude by referring my readers to *The Lancet* 1907 II and 1908 I where they will find a number of articles on this subject for a novelistic description of the attack and death from this disease to E Zola's *Fecondite*

A FURTHER REPORT ON TRAUMATIC FAT NECROSIS OF THE FEMALE BREAST AND ITS DIFFERENTIATION FROM CARCINOMA[1]

THREE ADDITIONAL CASES

BY BURTON J LEE, M.D., F.A.C.S AND FRANK E. ADAIR M D NEW YORK

IN May, 1920, we presented to the American Surgical Association, clinical and pathological data upon the subject of traumatic fat necrosis of the female breast, with two case reports pointing out the striking similarity of this disease to carcinoma Since that report, we have encountered in the breast clinic at the Memorial Hospital three additional cases, and these have furnished some new evidence as to the incidence of the disease and its clinical behavior

A careful search of the literature has revealed not a single reference, outside of our own experience, to this new interesting clinical entity It has however, been recognized by Dr Bloodgood, of Baltimore, who in a verbal report to one of us stated that he had already noticed the lesion upon two occasions One of his patients was diagnosed as a carcinoma of the breast and a complete radical operation performed Pathological examination proved the case to be one of traumatic fat necrosis and not carcinoma.

Our former study has made it possible to render a correct pre-operative diagnosis in one of our three recent cases, this particular patient giving a marked simulation to carcinoma The exactness of the traumatic history in this instance gave us at once a strong suspicion that the case was one of fat necrosis

The two other patients presented many features suggesting malignancy but the very sharply defined tumor caused us to render a pre-operative diagnosis of probably benign tumor Traumatic fat necrosis, therefore, still remains closely allied, in its clinical phases to carcinoma but some variation in its behavior may suggest the possibility of a benign process

We do not hesitate to admit that the clinical diagnosis may be difficult, even though the case may present a distinct traumatic history The gross pathological picture is characteristic but requires a pathological training and the surgeon should have the complete co-operation of the pathologist, in the operating room as well as in the laboratory if the patient is to be spared an unnecessary radical amputation

We are indebted to Dr James Ewing pathologist at the Memorial Hospital, for clearly outlining the important features of the gross and microscopical pathology Our former report contained a full description of the pathological appearances of the disease and the three additional cases have served but to emphasize the characteristic picture therein described

Concerning the difficulties of pathological diagnosis, Dr Ewing has pointed out that the microscopic picture may be a difficult one to interpret if the diagnosis by frozen section alone is relied upon Paraffin sections give a very much clearer microscopic picture

The complete report of our first two cases has been detailed in a previous publication[2] The three additional case reports follow

CASE 3 E.S married Russian age 40 was admitted to the Memorial Hospital June 10, 1920 having been referred to us by Dr William B Coley Patient's chief complaint was tumor of the right breast. The family history was negative for carcinoma. Patient had had four children, all living and well She had had no miscarriages. She had been operated upon by Dr Coley October 27 1910 for a colloid goiter which showed areas of adenocarcinoma.

Mammary history Had had four lactations, the first in 1914 and the last in 1917 During 1915 she developed an abscess in the left breast, which had to be incised At the time of the thyroidectomy 10 years before it had been necessary to give a hypodermoclysis which was applied beneath the right breast. *No hypodermoclysis had been applied to the left breast*

[1] Traumatic fat necrosis of the female breast and its differentiation from carcinoma with a report of two cases Tr Am S. Am 1920 xxxvii, 294-313, also Ann Surg P An. 1920, lxxii, 188-195

Read before the Surgical Section of the New York Academy of Medicine, October 7 19 1



Fig 1 Case Traumatic fat necrosis Gross appearance



Fig Case 1 Traumatic fat necrosis Gross appearance

Almost four weeks ago a lump was noted in the right breast. It had not increased in size had not been painful but had caused patient slight worry

Physical examination revealed a short corpulent woman weighing about 200 pounds The general

There were wide areas of areolar tissue about the nipples, and numerous dilated veins over the breasts. About 15 centimeters above the right nipple lying immediately beneath the skin, but not fixed to it was a tumor that was very hard, nodular irregular in outline measuring 8 by 6 centimeters There was slight fixation to deeper structures No nipple elevation or retraction were found, nor orange-skin appearance over the tumor There had been no discharge from the nipple and no enlargement of axillary or supraclavicular lymph nodes.

Provisional diagnosis Benign tumor Malignancy was considered improbable

Operation was performed July 2 1920 Ether anesthesia was used As it had been considered benign, a local removal of the tumor was made On section of the excised mass, there were two or three cystic areas with walls very thick and firm, the largest of which measured 2 by 2½ centimeters. The contents of the cystic cavities were of a semi

SUMMARY OF CASES

	Age	Weight	Trauma	Pain	Tumor hardened	Breast complained	Nipple retraction	Skin fixation	Deep attachment	Axillary nodes	Supraclavicular nodes	History visible hemorrhage	Patient noted duration	Preoperative diagnosis
Case	3	90	Blow on breast 2 mos										2 mos	CA
Case	36	21	Hypodermoclysis 7 mos							Soft			7 mos	CA
Case 3	49	195	Hypodermoclysis 20 yrs										mos	Benign tumor
Case	7	52	Hypodermoclysis mos										10 mos	Trauma fa necrosis
Case 5	34	180	Fell 3 steps striking front 8 yrs										3 wks	Fibroadenoma

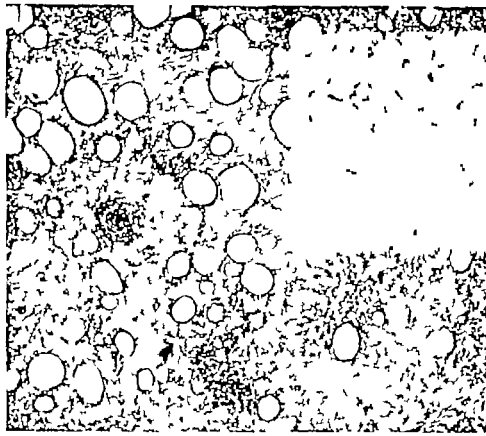


Fig. 3. Case 1. Microscopical appearance, showing endarteritis and peri-arteritis also fat cells and areas of necrosis.

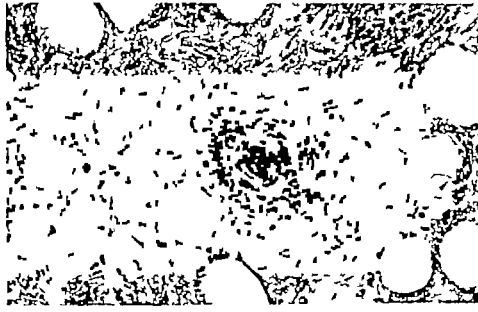


Fig. 4. Case 1. Microscopical appearance showing enlarged view of Figure 3. This shows fat cells dividing and zone of saponification in many fat cells, also some necrosis.

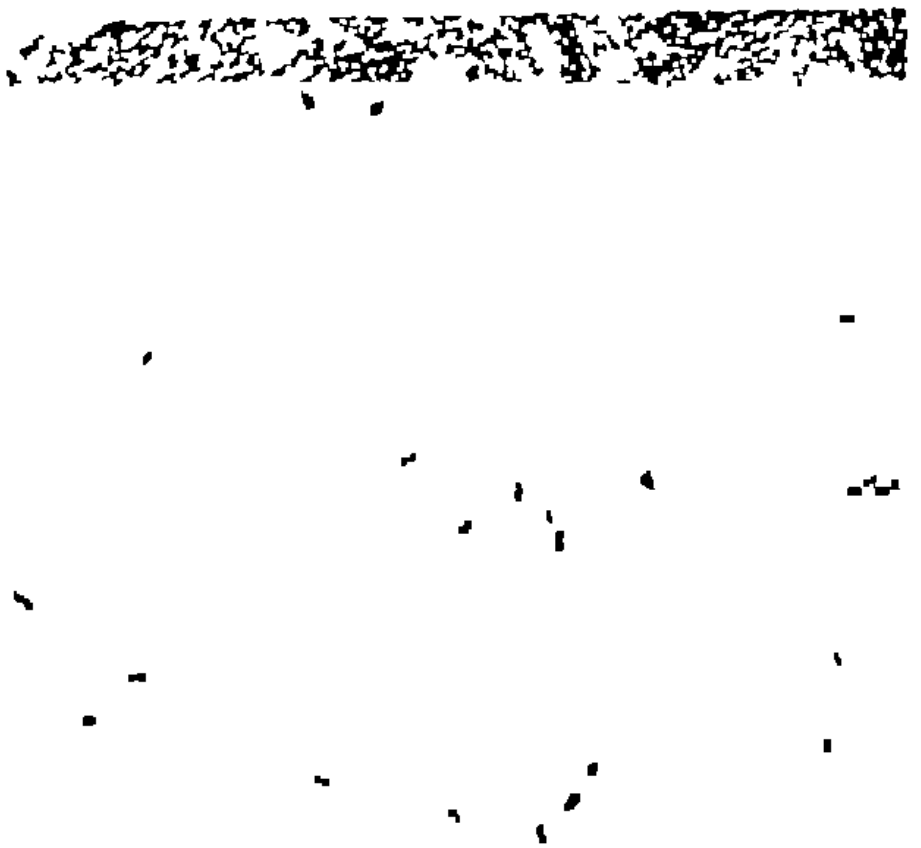


Fig 5 Case 1 Microscopical appearance, showing productive inflammation and giant cells along tissue spaces containing liquefied fat

fluid granular material The lining of the cyst wall was very irregular rough, and shaggy having a chocolate color It seemed that it might be a degenerated papillary-cyst-adeno-carcinoma With this diagnosis we proceeded to cauterize the wound edge and then did the radical operation for amputation of the breast

Pathological report Gross examination The breast was very large and very fat No definite islands of breast tissue could be seen The excised tumor was 3 centimeters wide and presented a cyst with whitish hyaline capsules 1 millimeter thick The contents were yellow granular material, semi-fluid Outside one-half the periphery of the cyst, the fat tissue appeared necrotic over an irregular area about 1 to 2 centimeters wide No definite signs of carcinoma were present

Microscopic examination Section showed a thick, 2 millimeters laminated, hyaline, connective-tissue wall surrounding the softened cavity which contained necrotic fatty material The breast tissue about this wall showed active productive inflammation with many round cells about the ducts of the breast, foci of lymphocytes, and new connective tissue No characteristic signs of lues No signs of tumor

CASE 4. M F, married, age 47 was sent by her physician to the Memorial Hospital in October 1920 "for advice as to radium and X-ray treatments for a breast tumor" Her chief complaint was tumor of the left breast The family history was negative for cancer Patient had always been well except for a tumor of the uterus which was operated upon 10 months before admission. Microscopic examination of the tumor had proved it to be a sarcoma

Mammary history Had one lactation in 1891 and another in 1895 Hypodermoclysis 10 months ago otherwise negative.

During January 1920, 10 months before coming under our observation, the patient was operated on

breast tumor was malignant.

Physical examination revealed a well-developed and well-nourished woman who appeared to be in good health

Breasts

not pendulo

left breast

left nipple was pulled downward 2 centimeters



Fig 6 Case 1 High power picture of Figure 5

Fig. 7 Case 1 Microscopical appearance, showing productive inflammation about fat cells.

below the level of the right. The left breast showed some pigskin appearance, and the veins over it were dilated while this was not the case over the right. At the junction of the breast and the chest wall, toward 8 o clock, there was a hard tumor measuring 6 by 4 centimeters showing slight skin adherence but no attachment to deeper structures. The tumor was movable in breast tissues nodulated and so hard that to palpation it gave one the impression of carcinoma. No palpable axillary or supra clavicular nodes.

Provisional diagnosis traumatic fat necrosis of *left breast*

Procedure outlined (1) X ray plate of chest graph (2) remove tumor under local anesthesia. Confirm diagnosis, proceed to a radical amputation if per cent nc ission was made well outside the palpable limits of the tumor and the mass excised On sectioning the tumor it was diagnosed as traumatic fat necrosis, and the breast wound was sutured

Pathological report An area of breast tissue 4 by 5 centimeters was the seat of chronic productive inflammation with much new fibrous tissue minute cavities, and streaks of opaque necrotic fat tissue Section showed new acellular connective tissue small foci of fluid fat surrounded by giant cells foci of necrotic or structureless fat and islands of normal gland tissue.

Case 5 G R. married, age 54 was sent by her physician to the Memorial Hospital October 6 1920, for diagnosis of a right breast tumor The family history was negative for cancer Patient had never had any serious illness. She has one child alive and well. No miscarriages. No uterine or ovarian disorders.

Mammary history One lactation 36 years ago with a duration of 9 months the child nursing both breasts. No history of abscesses or mastitis No history of hypodermoclysis.



Fig. 8. Case 1 Microscopical appearance. High power picture of tissue in Fig. 7



Fig 9 Case Traumatic fat necrosis Cross appearance

Eight years ago the patient fell 13 steps striking the upper inner quadrant of the right breast against the point of the pedestal The patient was a short, heavy woman weighing 180 pounds The trauma was followed by a large area of ecchymosis, which gradually disappeared Three weeks ago she accidentally noticed the presence of a lump in the upper inner quadrant of the right breast She thought that during this period the *tumor had not grown* appreciably No pain or sensitiveness was present in the breast at any time

Physical examination revealed a short, corpulent woman who appeared to enjoy excellent health Her cheeks were quite red Blood pressure 180, systolic Weight 180 pounds General physical examination negative

Breasts Large full, and slightly pendulous Left breast negative In the upper inner quadrant of the right breast situated 9 centimeters from the nipple toward 2 o clock, was a firm, smooth, spherical tumor measuring 2 5 centimeters in diameter There was a suggestion of skin adherence over it, but no fixation to deeper structures The tumor was movable in breast tissue There was no nipple retraction, no "pig skin appearance and no discharge from the nipple No palpable supraclavicular or axillary nodes

Provisional diagnosis fibro-adenoma or cyst adenoma

Procedure outlined (1) X ray plate of chest (2) photograph (3) a pre-operative series of five X ray

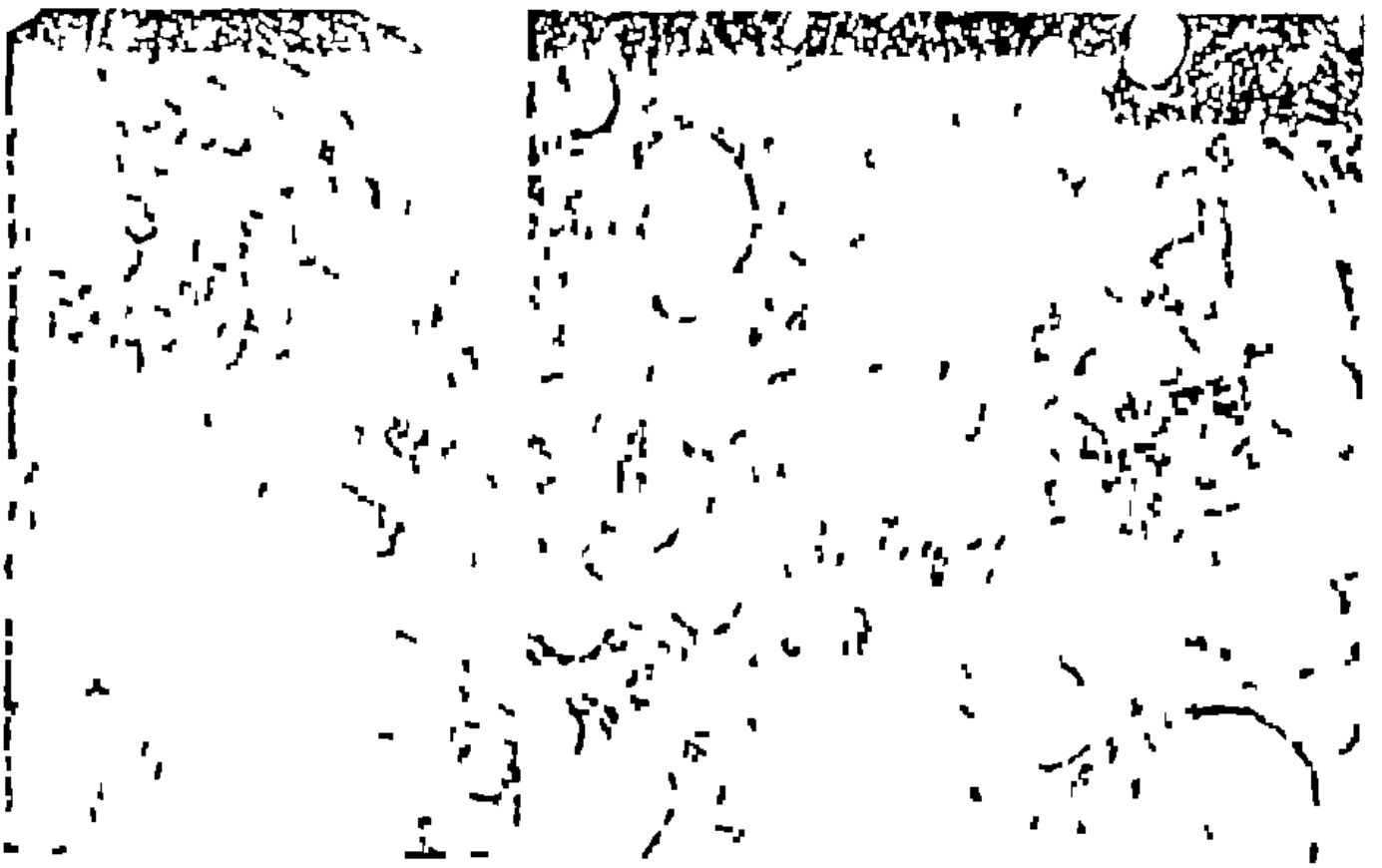


Fig 10 (at left) Case 2 Microscopical appearance showing new connective-tissue production about spaces containing fixed fat

Fig 11 Case 2 Microscopical appearance showing giant cells growing about tissue spaces containing diffluent fat Also new connective tissue production

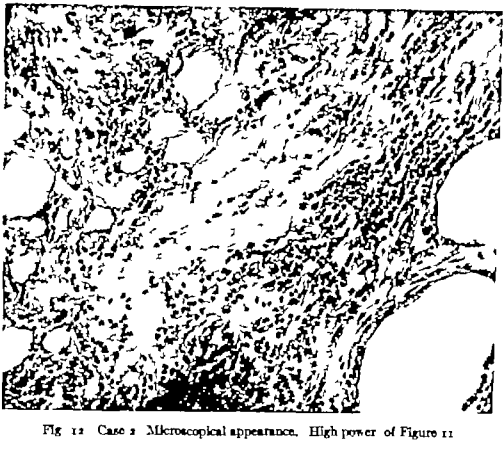


Fig 12 Case 2 Microscopical appearance. High power of Figure 11

treatments to be applied over the tumor and breast (4) local removal of the tumor under novocaine anæsthesia (5) If necessary a radical amputation should examination of the excised tumor require it.

Operation December 11 1920 One per cent novocaine anæsthesia Excision of stony tumor 2 5 centimeters in diameter Examination of the mass showed that the wall of the tumor was 0 75 millimeters in thickness and appeared to be calcified, while the cut section was of unusual appearance and hardness In the center of the tumor was a small cyst 1 centimeter in diameter containing a dirty yellowish brown thick, fluid Positive appearances of carcinoma were lacking so nothing further was done at operation Suture of breast wound

Pathological report Section showed chronic productive inflammation in fat tissue. There was a small central cavity filled with semi fluid fatty material, about which were many similar small cavities around which giant cells were forming

INCIDENCE

During the period in which these patients have presented themselves at the breast clinic, we have also encountered 120 cases of primary operable and 163 of primary inoperable breast carcinomata Traumatic fat necrosis of the breast, in comparison with primary breast carcinomata has occurred in the proportion of 5 to 283 or 1 8 per cent The occurrence of fat necrosis in comparison to primary operable carcinomata is as 5 to 120, or 4 2 per cent. Among our benign breast tumors the proportion of fat necrosis to other benign lesions is as 5 to 72, or approximately 7 per cent. Cases of fat necrosis therefore, are not rare

AGE

All examples of the disease have occurred at the age when cancer was to be expected The youngest patient was 36, the oldest 54

CORPULENCY

This seems to be an important factor In this series there was not one thin individual and every patient had more than the average amount of subcutaneous tissue All were heavy women none weighing under 152 pounds, while the most corpulent weighed 211 pounds The disease therefore apparently occurs in patients whose subcutaneous fat deposits are above the average

CORPULENT BREASTS

In every instance the breasts were large and full In one individual the mammary glands reached to the level of the umbilicus

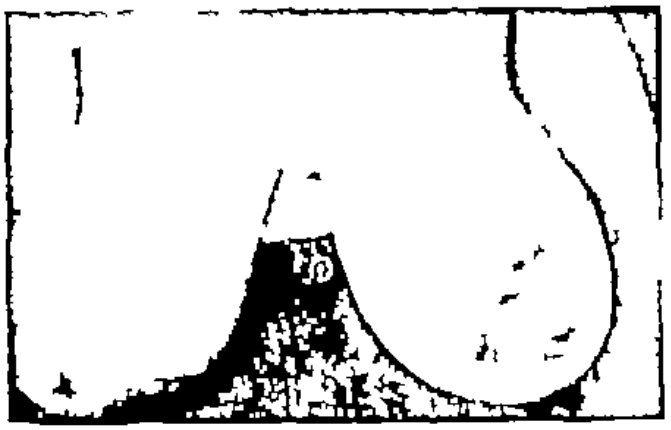


Fig 13 Case 3. Traumatic fat necrosis right breast Note corpulency

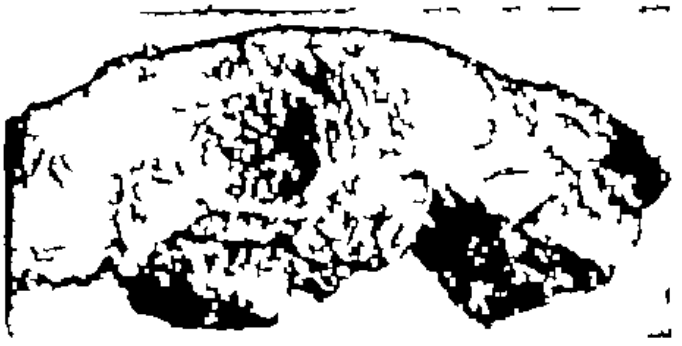


Fig 4 Case 3 Traumatic fat necrosis Gross lesion Outer areas inflammatory fat tissue Very firm wall. Necrotic center roughened and papillary in areas

TRAUMA

One of the chief diagnostic points is a *bona fide* accurate history of trauma Great care should be taken by the surgeon to assure himself that the site of injury coincides with the location of the fat necrosis Unfortunately although a history of trauma is too easily obtainable from patients suffering with breast carcinoma, it is frequently indefinite and inaccurate

Case 1 received a severe blow upon the breast delivered by the sharp point of an elbow





Fig 15 (at left) Case 3 Microscopical appearance showing much necrosis, also spaces of liquefied fat
Fig 16. Case 3 Microscopical appearance showing necrosis, large spaces containing fat fluid, giant cells and new connective tissue

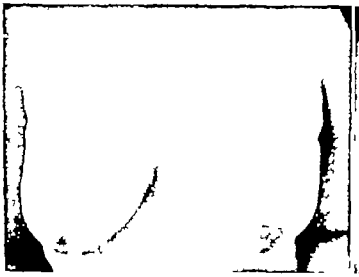


Fig 17 Case 4. Traumatic fat necrosis left breast. Note asymetry at lower inner quadrant of left breast.



Fig 18 Case 4 Same as Figure 17 showing skin attachment.

Case 5 a woman weighing 180 pounds suffered a definite trauma to the breast by falling 13 steps striking against a sharp corner of a post.

In three of our cases hypodermoclysis was a traumatic factor This has led us always to suspect a lesion of fat necrosis where hypodermoclysis has been administered previously

ECCHYMOSIS FOLLOWING TRAUMA

In two cases a definite ecchymosis followed the receipt of the trauma Such a history may be a valuable guide in establishing a diagnosis of fat necrosis

LACK OF PAIN

Four of the patients suffered not the slightest pain in or about the breast One (Case 4) complained of a slight transient pain at irregular intervals, but the symptom was not a marked factor

CONSISTENCY

A characteristic symptom of traumatic fat necrosis is the extreme hardness of the tumor Every one of the five cases showed a consistence sufficiently hard to lead one toward the diagnosis of a malignant tumor

NIPPLE RETRACTION

This symptom was obtained in but one instance and therefore may be regarded as an inconstant physical sign

SKIN FIXATION

In all save one, definite fixation of the tumor mass to the overlying skin was readily elicited and this should, therefore be considered a fairly constant symptom of fat necrosis This sign may strongly suggest a diagnosis of carcinoma.

DEEP ATTACHMENT

This was observed in two instances, but was lacking in the three other patients and cannot be regarded therefore as a constant symptom



Fig 19 Case 4. Traumatic fat necrosis. Gross lesion showing fat lobules areas of fibrosis and necrosis.



Fig. 20 Case 4 Microscopical appearance Large tissue spaces containing fluid fat some necrosis and new connective tissue



Fig. 23 Case 5 Microscopical appearance Large tissue spaces with some areas of necrotic fat and new connective tissue

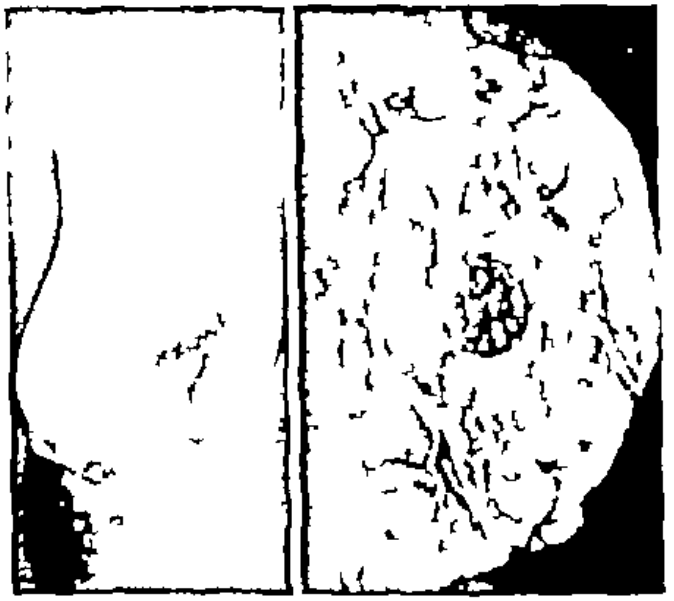


Fig. 21 Case 5 Traumatic fat necrosis right breast Photograph taken 6 da postoperative Note hea y type of breast

NODES

In all of the patients, except one no axillary or supraclavicular nodes were to be palpated and in this single case the nodes encountered were exceedingly soft and gave no suspicion of malignancy The absence, therefore of any definite node involvement may furnish a differential point between fat necrosis and carcinoma

DURATION

a From the receipt of the trauma to the recognition of the tumor There seems to be no constancy in this time factor as in the series under report there was a variation from 3 weeks to 10 years

Fig. 2 Case 5 Traumatic fat necrosis Gross lesion, showing fat lobules, inflammat ry zone, *ery firm* wall, necrotic center containing liquefied fat, and small pieces of calcified tissue

b From the recognition of the tumor to the beginning of treatment This period varied from 3 weeks to 10 months, so that here again no definite rule can be laid down

In our former communication a rapid increase in the size of the tumor was noted In the three additional cases now being reported no such history was obtainable and we therefore believe that rather less stress should be placed upon this symptom as a diagnostic aid

CONCLUSION

The present study furnishes important additional evidence that traumatic fat necrosis of the female breast is a disease not infrequently encountered and one which must always be carefully differentiated from carcinoma

We beg to express the hope that this report may stimulate surgeons and pathologists to a more careful scrutiny of the gross and microscopical pathology of all tumors of the breast in the belief that a thorough search for evidence will reveal many cases of this disease hitherto unrecognized

We desire also to suggest the possibility that some cases which in the past may have been diagnosed by the gross picture alone as carcinoma of the breast may not have been cancerous in their nature at all, but perhaps true examples of traumatic fat necrosis

DEPARTMENT OF TECHNIQUE

SOME NOTES ON PLASTIC OPERATIONS[1]

BY LEO ELOESSER, M D SAN FRANCISCO
Associate Clinical Professor of Surgery Stanford University Medical School

THERE are two ways in which to replace a missing part of the body one may use material from the neighborhood, if one can get it or, if none is to be had one may bring material from a distance.

In the first method the material is swung over to the defect on a stalk, and the stalk is retained as in Figures 1 and 2 the flap keeps its original blood supply which runs through the pedicle In the second method, when material cannot be had from nearby and must be got from a distance, it is necessary to uproot it, to lift it out bodily from its surroundings and transplant it to its new bed

It is clear that the first method is the one of choice not only is it more likely to be immediately successful, but it fills the gap with a tissue ultimately and always harder A flap that continues to be nourished through a pedicle is, of course, less risky than a free graft. There is always some risk that a free graft may die before the nutrient juices from its new bed have a chance to reach it This immediate risk, however is not the main objection to the free graft The chances of life and death for the various kinds of grafts

Wolfe-Krause graft done under other conditions will not. This immediate risk is not the main objection—we can circumvent it, if a sudden uprooting seems too dangerous, by making a gradual transplantation an Italian plastic (as in Fig 5) The Italian plastic combines the first and second methods It uses a pedicled flap at first, which it attaches to its new bed It ends with a free graft. For at the moment when the pedicle is severed, the transferred tissue *is* a free graft it retains no connection with its old bed

The main objections to the free graft lie not in its immediate results but in its ultimate outcome and these objections hold whether we do our graft as a free graft at one sitting or at several as an Italian plastic. The objections to the graft, the reasons why it is less likely than the flap ultimately to succeed are these The graft always remains an island entirely surrounded by scar The scar never disappears Elastic fibers that grow through it are never normal lymph vessels never pierce it Blood vessels and nerves may in time pervade it, but it is a question whether they ever become entirely normal blood vessels and nerves And so the graft island never comes entirely to resemble the tissue which it was intended to replace, nor even the neighboring tissue into which it was implanted. The scar barrier always remains The tissue island always has a tendency to turn blue, especially when it is exposed to cold it always has a tendency to become oedematous It withstands but feebly infection and ordinary small injuries—pressure and bruises

The flap even if it has but a slender stalk through which its original blood vessels, nerves, and, above all, its original lymph vessels run, is preferable in the end to the island left by the free graft

The only reason for resorting to free grafts at all is that they offer a source of practically unlimited supply and that the material, being entirely separated from its old bed may be twisted, shaped, and turned at will to fit its new one A device then should be a good one that will enlarge the area from which a pedicled flap may be swung and that will make the pedicle freer more easily turned, and twisted This device is the semidetached flap

THE SEMIDETACHED FLAP

The semidetached flap has but a step from the flaps emphasized by Esser Esser a Hollander who has published several articles in American journals[2] planned his beautiful facial flaps with the idea of having the main facial arteries run undisturbed through their stalks Thus he laid his pedicles on the cheek so as to include the external maxillary vessels in the nasolabial fold so as to include the angularis or on the side of the

Ann Surg 1917 lxv 697

From the Division of Surgery Medical Department, Stanford University Read before the Medical Society of the State of California, Coronado, May 1917

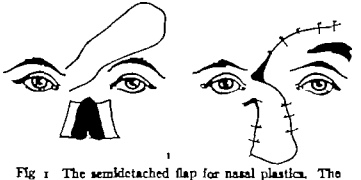
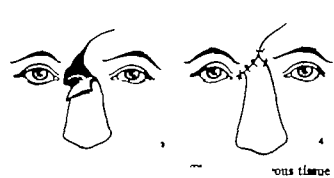


Fig 1 The semidetached flap for nasal plastics. The flap outlined

Fig. 2 The semidetached flap for nasal plastics. The flap turned down.

Fig 3. The semidetached flap for nasal plastics. The



...ous tissue
The flap
...ics Skin

head so as to include the temporal These large vessels flowing through even slender pedicles assured the nutritions of his flaps.

Esser, however, as far as I can find out, preserved not only the vessels in the stalks of his flaps, but left an attachment of skin To leave the skin attached is it seems to me, not always necessary The skin in the pedicle hampers movement of the flap It not only lessens the distance over which it may be pulled or stretched, but it lessens the arc through which it may be turned, or bent, or twisted.

Can we not entirely circumcise the skin if we leave intact a stalk of subcutaneous fat and connective tissue, with good blood vessels in it? This method will give the flap a greater range of motion not only a greater range but greater freedom. The blood vessels are more yielding

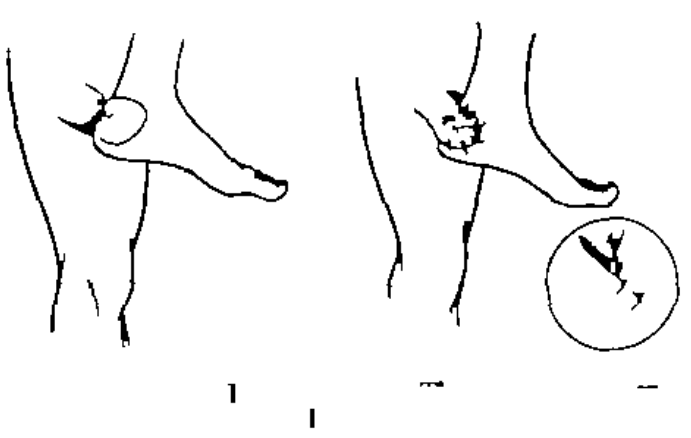
detached so long as it carries an intact stalk of

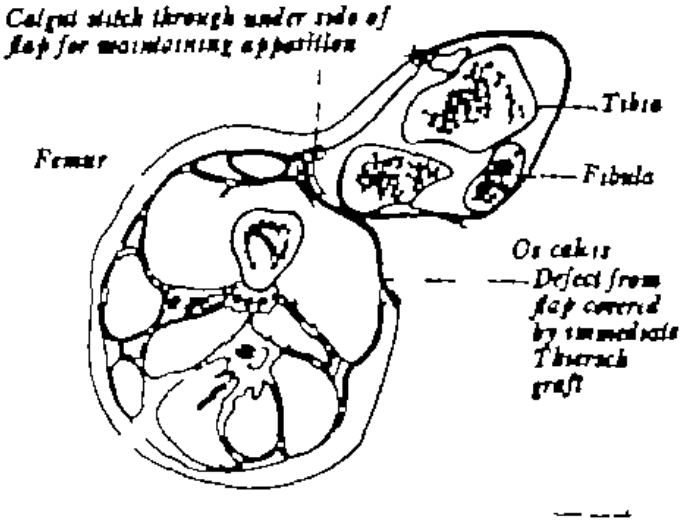
œdematous on slight provocation, for it keeps its original blood and lymph vessels that come from its original bed.

The semidetached flap is most useful in nasal plastics. The main objection to noses made from skin of the arm by the Italian method is that they tend to become blue and œdematous on exposure to cold The same objection holds for noses made by a pedicled flap from the skin of the forehead if the pedicle is cut in the later stages of the operation Severing the pedicle turns the pedicled flap into a free graft. If however we bring the pedicle from the inner canthus of the eye and preserve the frontal artery and the dorsalis nasi throughout all stages of the plastic, the new nose will always be nourished by a normal vessel. One may in the final stages of the operation sever the skin of the pedicle and transfer it to the glabella if one does not cut too deeply and leaves the artery uninjured in the flap A nose made by this semidetached flap which retains a stalk of normal blood vessels will not become blue or œdematous It will keep its vasomotor tone, and the blush will return to a spot made anæmic by pressure, as it does in normal skin.

THE STALK CARRIES MORE BLOOD THAN THE SCAR

The quantity of blood that a very slender stalk will carry is astonishing The vessels in it meet the overload that is put upon them when they are called upon to carry the blood to a large flap with a surprisingly rapid dilatation. If one detaches the pedicle of an Italian flap at several sittings and narrows the pedicle with incisions made a few days apart, the first incisions seem to lessen the blood supply of the flap very little. The flaps grow neither pale nor cyanotic. When however, the stalk is very slender (a centimeter or so across) and is finally severed it spurts most vigorously from large vessels And if this last detaching stroke is made too early say 2 weeks after the first operation, the flap may become necrotic even though the pedicle that nourishes it be no more than a centimeter across. The length of the line of union between the flap and the edges of the defect may measure many times the width of the pedicle, and yet it is the stopping of the blood supply through this last bit that turns the flap blue and necrotic. Even when the pedicle is severed at the proper time, when the circulation through the scar is sufficient one will see, if one watches the flap that it turns blue and cold the moment the pedicle is severed and then gradually recovers in the course of half an hour or so. This observation shows that more blood runs through the natural vessels in the last centi





graft

Fig 7 — A poor flap for an Italian plastic. The pedicle is too long. It is held in apposition by a mattress stitch over rubber tubing which will afterward cause the shaded area to slough. Insert shows a properly placed tension suture. A strong suture brings together the edge of the defect left by the flap and the edge of the defect which is to be covered

meter of pedicle than through the newly formed vessels in the fresh scar however long it may be

TECHNIQUE OF THE ITALIAN PLASTIC

In order to lessen the danger of necrosis, one should sew the free edge of the flap accurately to the freshened edge of the defect. Hard and in-

should be just tight enough to bring the edges nicely together. Tight stitches make the tissue they include anemic. Not only should the skin

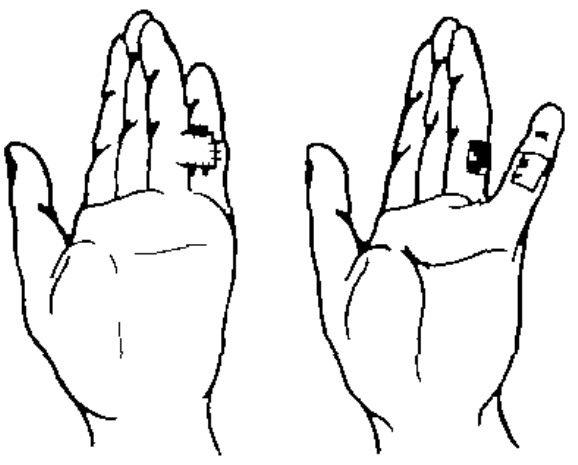


Fig 8 — A small Italian plastic for covering the defect

edges be brought together accurately but the raw under surface of the flap should be kept in broad and steady apposition to the base of the defect so that new blood vessels can grow into it from underneath.

If the flap will not stay in apposition by itself it may be fastened to the defect by one or two fine No. 00 catgut stitches passed through the defect and the under surface of the flap (Fig. 6). It should never be pulled over on to the defect by a mattress stitch or by any other stitch that makes tension on the pedicle. A slight tension anemia in the stalk will make a much greater area of anemia in the body of the flap. The anemic zone will spread out into the flap like a fan, the tip lying at the pedicle (Fig. 7). A mattress stitch through the pedicle will make a large slough around the stitch itself. Often the whole flap will slough. If tension sutures are unavoidable they should pass, not through the body of the flap nor through its base, but through the skin at each side of the base to the skin at the side of the defect. One may pull such stitches as tight as one likes without harming the nutrition of the flap. Indeed if the flap is under tension pulling it over toward its bed by sutures placed at each side will make it more slack and improve, not decrease, its circulation (Fig. 7a).

The free bridge leading from the base of the flap to the first point of attachment to its new

liable to infection and is wasteful of tissues. The bridge may be made short by sewing the sides of the flap well onto the defect, although these side

sutures are hard to place as they approach the base of the flap The flap should be taken from a part of the body which will lie snugly and easily against the free edge of the defect, so that there need be no long free bridge

In doing an Italian plastic it is a mistake not to give strict attention to asepsis It is true that there will be some postoperative infection of the raw surfaces, that the patient will sweat and otherwise contaminate his wounds, and that the dressings will be more or less inaccessible and hard to keep clean But the more carefully the patient is cleaned and shaved before the operation the less infection will there be afterward.

The best way to limit an infection is to make the raw surfaces as small as possible The edges of the wound left in the sound skin from which the flap was taken should be brought together by sutures. These stitches may be pulled very tight If they are properly placed they will decrease and not increase tension on the pedicle. If the skin cannot be brought together, and it is necessary to cover part of the wound with a Thiersch graft, the Thiersch graft should be applied immediately and not at a later stage. The immediate Thiersch graft not only saves time, for it heals the wound left by the flap by the time the pedicle is severed but it decreases the raw surface open to infection. The immediate Thiersch graft takes well, even though they may have to bear the weight of the grafted extremity if it lies upon them. They are usually perfectly immobilized by the apparatus that holds the two grafted parts of the body together

Infection damages the Italian plastic more than any other factor A severe infection will kill the whole flap but even a mild one that the flap can overcome will leave it boggy and thick, and make an ugly scar A small stitch abscess will leave an obstinate and torpid ulcer once the pedicle is severed and the blood supply of the graft impoverished The amount and severity of infection determine the time for cutting away the pedicle

WHEN TO SEVER THE PEDICLE

When to sever the pedicle is the nicest question in the performance of the Italian plastic. One is between two fires. The longer the flap remains attached the greater the scar shrinkage and infection the sooner it is cut off the greater the risk of necrosis. To balance properly the time between the two evils calls for delicate judgment.

The following plan has helped us to decide. We make an ample broad pedicle, and cut it through in several sittings. The first incisions

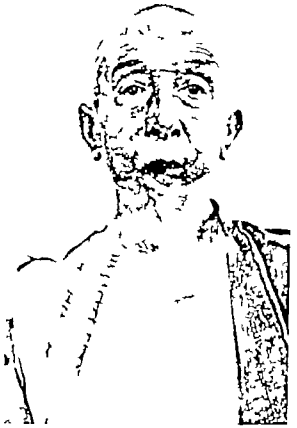


Fig 9 The bridge flap. First stage. A bridge of skin has been made between two parallel incisions, undermined lifted from its bed and stitched back into place

into the pedicle are made early about 10 days after beginning the plastic. They sever perhaps half or two-thirds of the pedicle, and are immediately stitched with a few horsehair sutures to the edges of the defect. Three or four days later a little more of the pedicle is cut. During the third week the blood supply of the flap is watched. One presses on it with the finger and sees how soon the blush returns to an anæmic spot When it seems safe, usually after about 3 weeks, the test is made for final severance. A thin elastic band is tied around the pedicle. It need not be tied tightly A very little pressure is enough to occlude the arteries. The flap is watched for 20 minutes or so It turns blue and dusky when the band is tied—almost always. This blueness is probably due to a reflex cramp of the vessels. If the blueness disappears in 15 or 20 minutes, the flap is safe, and one may cut the pedicle immediately or leave the band and cut the pedicle the next day (Fig 5) If however the flap stays blue and dusky one releases the band and waits a few days longer By applying and releasing the band every few hours, one might perhaps stimulate the new circulation through the scar

The patient should not be too uncomfortable [illegible]

his limbs forced into a strained position and kept there for this length of time is almost intolerable

THE FLAPS

The flaps should not include too much subcutaneous fat They tend to swell and to become boggy anyway The skin of the flap should resemble as nearly as possible, the skin of the neighborhood to which it is transferred For a transfer to the hand or forearm, the other forearm is better than the belly or chest, and it is easier to hold the two forearms together than it is to fasten the hand to the chest or to the belly

FINGER FLAPS

For flexion contractures of the fingers, the flap may be taken from the side of a neighboring finger This gives a very pretty result and very little inconvenience—merely the tying together of two fingers The scar on the volar side of the finger is excised A flap is cut from the side of a neighboring finger with its base toward the palm, and is stitched over the defect. The wound left by the flap is covered with a Thiersch graft. The base of the flap is cut in two or three stages, and the flap is finally severed after about 3 weeks (Fig 8)

or by leading it from one finger to another

BRIDGE FLAPS

The principle of the gradual severing of flaps may be used in parts of the body with poor circulation, such as the leg or where the flaps are to be made very long A bridge flap is very much better nourished than a single pedicled flap It

one side to the other The flap is left in place and the incisions are immediately closed with horsehair sutures (Fig 9) After a week or ten days the incisions at the tip of the flap are united by a cross incision, which is again immediately closed. This outlines a pedicled flap which, however is left in its original bed After another week or ten days a fresh incision is made just to the inside of the original ones and the flap is swung into its final position If the flap be planned as an Italian plastic, the pedicle is severed after 2 or 3 weeks and the plastic is complete.

TRANSPLANTATION OF STENSON'S DUCT FOR RELIEF OF DROOLING

A few words on an operation for the relief of drooling, which I have not seen described. The operation was performed upon the patient whose picture is shown to illustrate the bridge flap. A large recurrent cancer of the lower lip and jaw had been removed It was necessary to remove the chin and more than two-thirds of the whole jaw [illegible]

were reconstructed later As the jaw had been removed up to the third molar on the right side, Stenson's duct debouched not more than 1 centimeter from the edge of the new lower lip The mouth could not be closed tightly so that the poor man was made wretched by his drooling His shirt and waistcoat were continually wet with saliva He re-entered the hospital and begged for relief So much of the cheek and neck was gone that there was no material for perfecting the lower lip An Italian plastic would have been too much for this old man to stand. The drooling came from the right stenonian duct Both submaxillary salivary glands had been removed It seemed to me, therefore, that if the opening of the parotid duct could be laid farther back toward the pharynx, the saliva might run down his throat instead of dribbling from his half-open mouth

A transverse incision was made in the cheek and the duct, which was about 1½ inches long, was dissected from the front edge of the parotid to the papilla The papilla was cut out from the oral mucosa, and a catgut stitch was passed through it A small stab wound was made through the rear edge of the masseter into the back of the mouth near the pharynx, and the catgut stitch to which the parotid duct was fastened, was passed through it into the mouth By pulling on the stitch the parotid duct was made to follow A half inch or so of it was left dangling into the rear of the mouth near the pharynx. The man's drooling was greatly lessened, but not entirely

second patient operated upon for cancer of the lip and cheek. This transplantation was done as a primary procedure, forming a step in the plastic

closure of the wound. The operation was easy, and might be worth considering in men whose lips cannot be closed, and the fronts of whose mouths have been destroyed.

SUMMARY

1 A graft of the whole thickness of skin, whether done at one sitting as a Wolfe Krause graft, or at several, as an Italian plastic, always remains an island surrounded by scar

2 It turns blue on exposure to cold and is little resistant to infection or trauma.

3 A pedicled flap which retains the normal vascular connections does not have these disadvantages.

4 A procedure is described for making a semidetached flap, severing the skin of the pedicle but retaining its vessels Such a flap has much of the freedom of a free graft but does not have its disadvantages.

5 More blood runs through the pedicle of an Italian plastic flap than through the line of union with its new bed no matter how narrow the pedicle or how long the line of union

6 The vascularity of the pedicle should not be damaged by mattress or tension sutures.

7 Infection should be limited by covering the defect left by an Italian flap with an immediate Thiersch graft.

8 The viability of the flap is determined by temporarily occluding the pedicle with a rubber band before finally severing it.

9 The defect, after excision of a flexion contracture of a finger may be covered by a flap from a neighboring finger

10 Drooling may be relieved by transplanting Stenson's duct backward

DEMONSTRATION OF BLADDER DIVERTICULA

By HERMAN L KRETSCHMER, M D F A C S Chicago

As a rule, diverticula of the bladder are discovered during cystoscopic examinations Cystoscopic examination gives information regarding the number and location of the diverticula but it fails to give us any information regarding their size or capacity Failure to obtain this information is one of the limitations of cystoscopy in cases of this type



Fig 1 Roentgenogram of injected diverticula

desired information because of the position of the diverticulum.

The passage of shadowgraph catheters into the diverticulum has been resorted to at various times and this may be followed by an injection of the diverticulum through the ureteral catheter with one of the usual opaque media which are used for this purpose. This method gives more accurate information than either of the two previously mentioned methods and has been reported by various authors

In order to define more clearly the extent of the diverticulum, we have combined the latter



Fig 2 Roentgenogram of the injected diverticula after filling the bladder with air

method with air cystography After the diverticulum is injected, the bladder is filled with air This procedure is an aid in producing a much sharper definition a fact evident after an examination of the two plates.

OPERATING CYSTOSCOPE IN APPLICATION OF RADIUM TO CANCER OF THE RECTUM FOLLOWING COLOSTOMY

By JOHN O BOWER M D F.A.C.S., PHILADELPHIA
Associate in Surgery Samaritan Hospital

IN malignancy involving the bladder or rectum direct application or implantation of radium into the growth has been fairly successful Undoubtedly, better results are obtained however when these growths are subjected to cross fire

In the bladder this may be accomplished if the growth is situated on the anterior wall by applying radium directly against it, using an applicator or by the use of a hollow metal sound, crossfire being obtained by imbedding radium needles near or into the base of the growth through a suprapubic incision if the growth involves the base, an efficient crossfire may be obtained by using a special applicator through the cystoscope in conjunction with a hard rubber applicator in the rectum

A number of instruments have been devised for intravesical application, and crossfire employing the methods mentioned is not new I wish however to report a method of treatment of cancer of the rectum using the operating cystoscope. Three cases of cancer of the rectum have come under my observation recently in all of which an operating cystoscope and a specially devised applicator have been used to great advantage in implanting radium in the proximal portion of the growth an effective crossfire being obtained by inserting radium properly screened, against the growth through the anus.

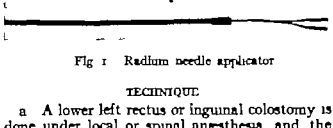


Fig 1 Radium needle applicator

TECHNIQUE

a A lower left rectus or inguinal colostomy is done under local or spinal anæsthesia and the bowel is opened on the third or fourth day by the use of the thermocautery

b On the seventh or eighth day the lower segment is flushed clear of all débris, using a 25 F catheter attached to a 1000 cubic centimeter reservoir, when the fluid returns clear the cystoscope with irrigating tube attached is inserted into the bowel the obturator is withdrawn the telescope is inserted and the special instrument holding the radium needle is introduced into the cystoscope and the radium needle with silk cord attached is imbedded into the growth The instrument is then withdrawn and as many needles as required introduced. The free ends of the

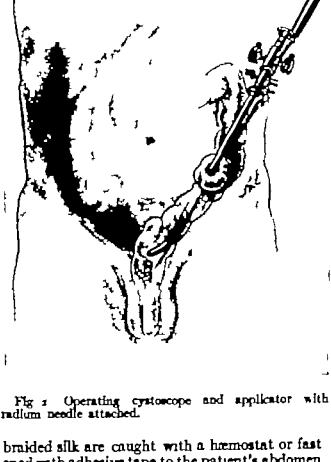


Fig 2 Operating cystoscope and applicator with radium needle attached.

braided silk are caught with a hæmostat or fastened with adhesive tape to the patient's abdomen

c. Then using a hard or soft rubber applicator radium properly screened is inserted against

THE TREATMENT OF CONGENITAL HALLUX VARUS

By ALEXANDER MacLENNAN M B C M Glasgow Scotland
Visiting Surgeon, Royal Hospital for Sick Children Barclay Lecturer on the Surgical Diseases of Children, and Orthopædics, Glasgow University

THE textbooks give very little information regarding hallux varus and indeed, most of them infer that the condition is merely part of the deformity in talipes varus In the common variety of talipes equinovarus it is true that the varus element frequently persists as the well-known pigeon toe but it arises from deformity of the tarsus while in the malformation under discussion the defect is confined to the great toe Were the deviation of the pigeon toe due to defect in the phalanx, its cure might rightly be left to be effected by the modern boot. The similarity of the two cases is so close that the malformation would appear to be stereotyped.



Fig 1



Fig 2



Fig 3

Fig 1 Schematic drawing showing incision, graft and wedge
Fig Cast of Case 1 before operation
Fig 3 Case 1 Result of operation

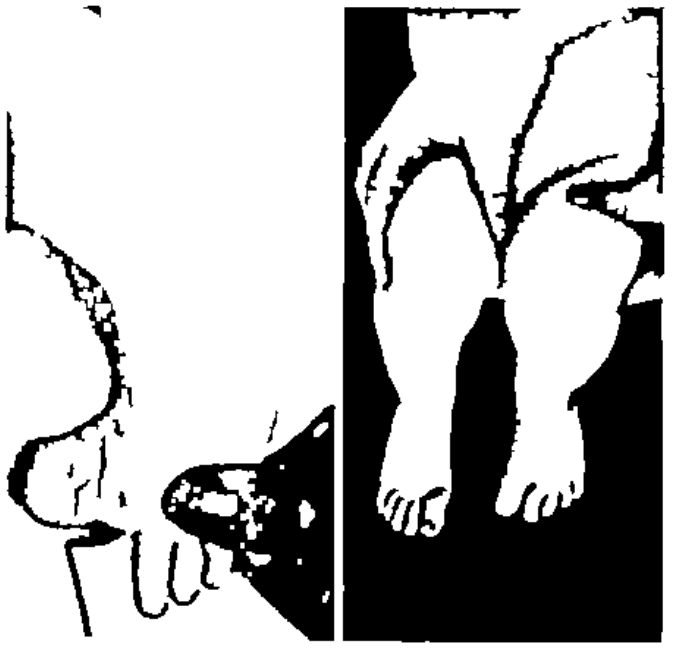


Fig 4(at left) Case 2 before operation
Fig. 5. Case 2, after operation.

The toes were double, fused, and were placed at right angles to the long axis of the foot. The malformation would appear to be stereotyped The X ray plate showed the metatarsal bone to be normal Both cases were brought to the Hospital in 1920 within four months of each other

The procedures adopted to correct the deformity may be summarized as follows

1 The structures on the proximal side were divided by open incision at right angles to the axis of the toe (Fig 1 incision)

2 The
the other t
raw surface
phalangeal joint

3 A skin graft is required to fill in this gap and it is exactly formed by the redundant tissue requiring to be excised from the web between

5 The duplicity of the toe itself requires primary treatment. Removal of the innermost

toe would result in a cicatrix strong enough to excite a recurrence of the deformity To prevent such an action, a scar should not be located along the inner border of the toe but a wedge should be removed from the tissue of the fused toes each being taxed one half (Fig 1, wedge)

This procedure is that commonly carried out for the building up of a single in place of a bifurcated, digit.

The accompanying photographs show the condition before operation and the results obtained in Cases 1 and 2

AMPUTATION STUMPS AND THEIR ADAPTATION TO ARTIFICIAL LIMBS

BY CARL BEARSE M D Boston

Second Assistant Visiting Surgeon, Beth Israel Hospital Junior Assistant Visiting Surgeon, Boston Dispensary Clinical Assistant Children's Hospital

FOR about 1 year, while making orthopedic examinations for the Public Health Service, the writer had the opportunity of observing a large percentage of the amputation cases in New England that resulted from the late war The comparison of these cases with the end results of civilian amputations seen in general hospital and private practice forms the basis for this article.

Practically all ex service men having amputations had been kept as patients in their respective service hospitals until they were able to walk with an artificial limb They were instructed to wear these temporary artificial limbs for at least 6 months, to have them adjusted as necessary during this time, and at the end of this period to apply for permanent limbs

After being discharged from army or navy hospitals, these patients were referred to the Public Health Service for further treatment or prosthesis as necessary When first seen these men called to have their temporary limbs repaired, to apply for permanent artificial limbs, or to have some stump affection cared for which prohibited the wearing of the temporary or permanent artificial limb

The operative results were very satisfactory Flexion deformities were extremely rare, and the range of motion in the joint just above the amputation site was usually unrestricted. A small percentage had tender scars from neuromata, and there were several that had discharging sinuses from osteomyelitic processes. Tender scars were resected and sinuses healed before such cases were referred for permanent artificial limbs.

It was rare to run across a man who had been operated on but once. Nearly all had had two or more amputations, the reason commonly being that infection was originally present others had to be re-operated upon owing to an unsatisfactory amputation site having been selected and for no other reason.

The outstanding feature about these cases was that they were treated through to the actual walking stage How different was the story related by several limb makers who were interviewed They stated that in civil practice most of their cases were referred by others similarly maimed very few were referred directly by the surgeon of those that were so referred very few were still under the surgeon s observation But more than this, they stated that in many instances in selecting the amputation site the surgeon apparently gave no thought to the future usefulness of the stump Owing to a lack of interest on the part of the surgeon in the interval between the operation and the fitting of the limb many patients reported with deformities, such as flexion contraction which could have been prevented and which seriously interfered with obtaining maximum service from the prosthetic appliance. In other words, lack of co-operation between the limb maker and surgeon frequently caused bad results which were preventable.

As a result of the observations made in the course of examining these patients, together with the information obtained from limb makers, with whom the writer has been in close touch, the following suggestions seem warranted.

THE STUMP

In general we want an amputation stump that will be covered with just enough skin and muscle so that the slack will be freely movable over the end and yet not redundant. There should be an entire absence of sharp corners, pain, or tenderness, and the scar should be linear non-adherent and posterior to the end of the bone. The joint *just above the amputation should have the full* range of active motion and above all the stump

should be long enough so that the best appliance possible under the circumstances can be utilized

In this country where artificial limbs have reached a very high state of development, owing to the large number of wounded as the result of the Civil War a wooden socket is used. This is constructed of willow covered with horse hide, and it is with this type of prosthesis in mind that the following recommendations are made.

UPPER EXTREMITY

The upper extremity from the prosthetic viewpoint provides a far greater problem than the lower for there are no such standardized and satisfactory prostheses for the upper as there are for the lower extremity so that no definite rules can be laid down for observance in amputating

In the hand as much tissue should be left as possible, for all the limb maker can do is to produce something in the nature of a cosmetic result, except perhaps he may supply a hook to be worn, if the fingers are gone and manual labor is to be performed

tender and painful from the pressure and friction of the socket of an artificial hand Amputation just above the styloids will give a shorter and far more satisfactory stump and yet will permit the

shorter than this is of no use, as on flexion it ceases to exist as a stump anteriorly the biceps tendon and the flexors of the forearm completely obliterate it, and push the socket of the artificial arm off

An amputation through the elbow joint is unsatisfactory It does not make a good bearing surface for the prosthetic appliance It makes the artificial arm longer than the other for the elbow joint of the artificial arm has to be at a lower level than the condyles of the humerus in order to get full flexion Again, since through the condyles we have the greatest diameter of the arm, a wooden socket cannot be used, as all of it would have to be large enough to get by the condyles, and that would make it too large at the upper arm Above the elbow we should save as long a stump as possible

It may not be out of place here to mention the attitude toward arm appliances of our war veterans who have lost arms All were given temporary arms on discharge from the army hospitals which they wore for varying periods to toughen the stump for cosmetic purposes raising morale, etc. When they appeared at Public Health Service offices for permanent arms, they practically unanimously requested mechanical arms, like the Cairnes, Dillworth and Miracle, with which the sleeve is filled out, which have a hand covered with a glove which looks quite natural, and which allows the flexion and extension of the fingers and flexion and extension of the elbow But after a thorough tryout many came back for a more simple apparatus, such as a hook, with which they could actually perform some manual labor and which could be of assistance in their work. Of course for men who do not have to use their arms for heavy work as office workers and professional men the mechanical arm is the ideal one, as it can be used to hold light objects, and to manipulate a typewriter for instance.

The important thing to remember in prescribing prosthesis for amputations in the upper extremity is that the remaining arm should be educated to its utmost, and the artificial arm should be used only as an aid. In most cases if an apparatus is furnished that has an interchangeable hook and hand, the latter for dress purposes

appliance whatsoever but depended entirely upon their stumps.

THE LOWER EXTREMITY

In the upper extremity the stump serves as an anchor for an appliance but in the lower, there enters in addition the very serious problem of weight bearing

While the body weight is, to a certain extent, carried by all of the surface of the stump yet certain parts of it are capable of carrying more than the other parts—and this apportionment of work for certain parts of the stump depends directly on the nature of the amputation. It is possibl

all of
so-call
stump
is onl

substitution by utilizing the bony parts in the joint just above the amputation site. Such utilization of the bony parts together with the surrounding soft parts constitutes lateral bearing A combination of end and lateral bearing may also be used

The end-bearing type of stump requires no further description While it offers a definite advantage in that it gives a firmer hold on an artificial leg yet in most cases no sacrifice should be made for it, as it is not essential The amputation sites where end bearing is imperative are in the Symes operation and through the knee.

In the lateral bearing stump the weight is borne, if in a thigh amputation principally by the tuberosity of the ischium and the soft parts. In leg amputations the weight bearing is taken by the lateral surface of the tuberosities of the tibia, and the upper part of the lateral surfaces of the tibia and fibula, but not the head of fibula.

THE FOOT AND ANKLE

Toes A single toe should never be left, as it almost always becomes deformed and offers difficulties when it comes to the wearing of a shoe. When all the toes are amputated the best result is obtained by utilizing a plantar flap The amputation completed in most cases no further treatment is necessary except an appliance such as a cork sole to fill out the shoe. But some feet owing to loss of the big toe and dropping of the anterior arch, may require arch supports.

The Chopart (mediotarsal) and Pirogoff (tibiocalcaneal) amputations are so whole-heartedly condemned by limb-makers, that they should, on general principles, be avoided The objections are that at these sites, there is an unequal pull between the flexor and extensor tendons of the foot resulting in various deformities of the stump usually equinus with tilting of the heel, and often complicated with pressure sores and tender areas. The prosthetic appliances required by these amputations are not only hard to fit, but they are clumsy and give rise to many practical difficulties. On the other hand there are many advantages in having the amputation site higher up, where excellent practical results can be obtained.

The tibiotarsal (Symes) amputation has caused more controversy than any other amputation Surgeons on the whole are in favor of it while artificial limb-makers generally condemn it. The disagreement is due to the fact that the operative result usually causes the artifical limb-maker a great deal of trouble

Theoretically the Symes if properly done is an ideal operation, but in practice it often does not turn out as the surgeon wishes. Its success hinges mostly on one factor, that it be absolutely end bearing while what actually happens is that a tender scar neuroma, displacement of the flap or other misfortune usually prevents the end of the stump from bearing weight.

If the stump turns out well and will bear weight, the ankle of the artifical leg has to be made thicker than the normal ankle, but as vanity plays as great a part in the maimed as in others, this forms a source of objection which the limb-maker cannot remedy as making the ankle thinner will so lessen its strength as to make the limb dangerous to wear

The surgeon will find it a good rule, unless he is particularly apt and skillful with the Symes and the patient is willing to have the thick ankle not to do this operation but to choose the higher site—the point of election.

THE LOWER LEG

The ideal leg stump is one 6 to 8 inches in length this is long enough to propel the artificial limb can be fully flexed without the socket falling off and the limb can be nicely tapered off so that both ankles will look alike There is nothing gained by having a longer stump but instead there may be several disadvantages. For instance, in amputations lower down, the stumps are usually more poorly nourished, they have more of a tendency to ulcerate are more affected by cold, and the scar is more liable to break open

In cases where it is not possible to utilize as much as 6 inches of leg, an attempt should be made to come as close to it as possable, the minimum being the point where on flexion to a right angle the socket begins to slip off The shortest effective stump seen was 1 75 inches below the lower border of the patella. This man can utilize his knee joint to its fullest extent in walking and can sit with his knee flexed to a right angle.

In short leg stumps it is advisable to remove the fibula, for the head of that bone in many cases is a source of persistent trouble. As the stump shrinks the head becomes more prominent, the socket rubbing constantly against the head causes the skin over it to become inflamed and tender, and the irritation may go so far as to set up a periostetis

THE KNEE

Above this point it is advisable to amputate at the knee joint, for even though very short stumps can be used as end-bearing in the flexed knee position, this is not advisable, owing to the frequent complication of bursitis, and the visible deformity at the knee in the apparatus

Here again success depends on getting an end-bearing stump.

[illegible] in the operation, unless the surgeon is particularly

skilled in this technique he had better do a trans-condylar amputation, near the upper part of the condyles, removing the patella If the cicatrices are carried high and posteriorly this should give an excellent result.

THIGH AMPUTATIONS

The rule in thigh amputations should be the same as in the arms Save all you can.

After comparing the limps in those that have had amputations through the thigh with those that have either a knee joint, or ability to carry weight at the knee, the first thought is "Could a lower amputation have been done? While a thigh amputation with proper prosthesis gives a walkable limb yet it is so inferior to amputations below or through the knee, that all measures should be attempted before sacrificing that joint.

If an amputation through the thigh must be done then, generally speaking as much of the stump should be saved as possible Speed states that however short the thigh stump save it, rather than disarticulate Even sawing through the neck of the femur gives a better and firmer base for the artificial limb than a disarticulation

STUMP AFFECTIONS

The army has demonstrated the fact that an artificial limb cannot be worn too soon after an amputation that the limb should be applied as soon as the stump can stand it, in many instances before the wound has entirely healed. If massage of the stump is started about 10 days after the operation, followed by bandaging with increased pressure, then hydrotherapy in the form of warm baths hot packs and contrast baths, and later with gentle pressure by the stump on a pillow

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that it raises morale, improves the general physical condition, and hastens shrinking and toughening of the stump

Treatment of the various stump affections is the same as for similar lesions elsewhere, except that the wearing of the artificial limb should not be lost sight of The longer the patient goes without his limb the greater the tendency for the stump to become flabby and consequently the longer the interval before he will be able to handle his artificial limb with any degree of facility and comfort. This is particularly true in the lower extremity and may be the cause of delaying their return to their occupations In the after treatment of stump affections, early walking is just as beneficial as after the original operation and for the same reasons.

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between stump and socket, mal-nutrition of short flaps with poor circulation, pressure of sharp corners on edges of bone, or local infection. In

proves unsatisfactory the stump should be put at rest. It may be necessary to excise the ulcer or even reamputate, in cases of painful, chronic ulcers associated with poor circulation, which prove recalcitrant to local treatment.

Enlargement of the stump As a general rule stumps atrophy after amputation, owing to loss of adipose tissue from the work they are put to in propelling the artificial limb but not infrequently a stump will increase in size. This is usually due to the fact that the patient who has previously been engaged in some active occupation has now owing to loss of a limb taken up a sedentary vocation, and as a result has put on

of the limb socket.

Stump swelling This is a condition that comes on promptly in some stumps after the removal of the artificial limb, so that in some instances on awakening in the morning the patients are not able to get their stumps into the sockets. Several patients stated that they have had this overnight swelling for several years.

The treatment is to bandage the stump upon retiring The Bender cotton elastic bandage is very efficient for this purpose.

Tender scars and neuromata Until these complications cause enough pain to prevent the use of the artificial limb the stump should not be molested, for should the subject be so unfortunate as to have frequent recurrences of these conditions it is easy to see where he may be laid up at frequent intervals.

It is sometimes possible to free adherent scars by physiotherapeutic measures, and so relieve the tenderness Should this not help resection of the scar must be done. The placing of the scar posteriorly to the stump at the time of the original and subsequent operations help in a large measure to prevent the tenderness

The neuromata, if sufficiently painful to prevent walking should be dissected out and severed

at as high a level as possible. Good results have been reported in preventing recurrences by the alcohol injections of these nerves after their severance.

If at the time of the original operation the nerves are divided at a higher level than the other structures, that will help to prevent the formation of painful neuromata. Then, should the nerves continue to grow, they are more likely to be lost in beds of muscle which serve as cushions and prevent pain on pressure.

Conical stump This condition is most frequent in children, and is usually due to the growth of bone in the stump The bone may become adherent to the scar, causing pain and ulcer formation. The treatment is reamputation. In adults a similar condition may be brought about by the flap being too short, causing retraction and shortening of muscles. The treatment is the same as for children.

Periostetis (irritative) In some stumps due to irritation between the stump and the socket of the artificial limb, an inflammation of the periosteum may be set up The diagnosis is made by ruling out other conditions and sometimes can be substantiated by X ray

The treatment is removal of the source of irritation, which means changing the socket, or going without the limb until the acute symptoms have subsided. In some stumps, if this condition is due to a thin flap a reamputation may be necessary in order to get a thicker flap

Exostoses A proliferation of bone, usually from tabs of periosteum, giving rise to spicules in the end of a stump, may also be the cause of pain. The diagnosis is confirmed by X ray The treatment is the surgical removal of the proliferative processes.

Sinus This is a fairly frequent complication. While in some instances it may be due to an osteomyelitic process yet most of the cases seen had no bony etiological factor The majority of these sinuses were in the middle of the scar It is the writer's impression that they are caused by the too long-continued use of a wick for drainage purposes. Cotton thinks that often it may be due to sheer malnutrition from the mass of tough scar

The treatment is surgical. If there is an osteomyelitic process present and the stump is long enough reamputation is usually the more reliable and satisfactory method If the sinus has no relation to bone and is at all chronic, complete removal of the sinus is the method of choice. The writer had occasion to see a woman 17 years after both legs had been amputated as the result of a railroad accident. One stump had healed perfectly, but the other had a persistent sinus which had been discharging pus since the amputation and which made walking uncomfortable The sinus was resected within 3 months the stump had healed and now for 18 months has remained healed and symptomless

If, at the time of the original operation rubber dam is used for the wick and is inserted at the extremities of the incision and not kept in for more than 3 days, a non-osteomyelitic sinus should be a rarity

Flexed leg stumps This condition with rare exception is due to improper after-care. If before the patient leaves the operating table, a posterior splint is applied and kept on until active motion is established and then early walking in an artificial limb prescribed, this complication will be avoided

Since the first temporary limb can be used only for a relatively short time owing to the rapid changes which take place in a newly constructed stump it is advisable to construct a home made limb which will enable the patient to get up and around with all of its beneficial results. This limb can be made by making a cuff of plaster-of Paris on the stump as far away from the end as possible (lateral bearing) and incorporating in it a double metal upright with a footpiece, or the army pylon ' can be used, which is a bifurcated wooden splint resembling a crutch These are easily made, the patients can walk comfortably with them and they also permit the dressing of the stump should it be necessary

Once the flexion deformity is established the treatment depends on several factors. If the patient can walk on a flexed stump and has no symptoms, and does not object to the evident deformity then he should continue to do so. However, should the deformity be objected to or walking with flexed knee be painful, then either tenotomy, wedging or traction should be used depending on the length of the stump the length of time it has been flexed and the condition of the joint. Once appreciating the value of the knee joint in locomotion, too many precautions cannot be taken to prevent this deformity

SUMMARY

1 Do not lose sight of your patient after an amputation until a properly fitted limb has been prescribed and is worn. The sooner it is worn the better

2 Instruct patients that if at any later date they have pain to return to you—and not to the limb-maker

3 There are no standardized apparatus for stumps of the upper extremity Generally speaking save as much as possible, avoiding joints.

4 On the lower extremity avoid the tarsal

6 The ideal site of amputation in the leg is 6 to 8 inches below the knee try not to make the

being end-bearing if doubtful about the outcome amputate at the point of election

longer it will take him to become accustomed to wearing it again

CORRESPONDENCE

TRUE AND FALSE KNOTS IN UMBILICAL CORD

To the Editor Mrs J age 44, VI para, reported her pregnancy early as is the rule in our service here Pregnancy was normal up to the thirty eighth week, when the patient reported that there was absence of motion Abdominal examination revealed motion, and also heart sounds could be elicited with the stethoscope The patient thought there was undue "settling but otherwise all was normal. Up to this time the movements of the fœtus had been more than usual, but they subsided now However the mother was satisfied that there was still movement.

Ten days later I was called and after a normal labor a male child was delivered stillborn The cord was around the neck twice and had to be divided twice before the head could be delivered No other interference was necessary hence I call it a normal delivery

There were four true knots and six false ones in the cord which was normally long and of the usual size. The child had been dead possibly 2 or not more than 3 days, was perfectly formed and normally developed Save for the abnormality of the cord the case was normal, and the mother made a normal recovery

The case is of further interest, because the sister in-law also lost a child the same way but not in this service This is the second stillborn child of this parent, but we have no history of the former case I had never seen a case similar to this one, and therefore thought it worth reporting The unusual activities of the fœtus no doubt caused the knots. The mother had lost a baby the second pregnancy before this one, and in this instance, had been particularly careful as she desired another baby

The Chinese say they never have such cases, and none has ever come under my notice. The specimen is in the Museum of the West China Union University

WALLACE CRAWFORD M.D

Tsetatsing, China.

A CORRECTION

On page 154 of the January 1922 issue of SURGERY GYNECOLOGY AND OBSTETRICS In the report of the Hospital Conference of the American College of Surgeons in Philadelphia, the discussion on case records attributed to Dr Edward A. Weiss of Pittsburgh should have been attributed to Dr John D Singley

A C. S.

EDITORIALS

SURGERY, GYNECOLOGY AND OBSTETRICS

FRANKLIN H. MARTIN M.D — Managing Editor
ALLEN B. KANAVEL, M.D — Associate Editor

APRIL 1922

THE SURGERY OF THE RIGHT BOWEL

THE early Egyptians understood the value of keeping the large bowel above reproach, for, as early as 1400 B.C., one may find directions for the preparation of enemata. It is possible they took their cue for this from the holy bird, the *ibis*, which was supposed to live forever. Of this bird Pliny in A.D. 77 wrote "He washes the inside of his body by introducing water with his beak into the channel by which our health demands that the residue of our food should leave."

In the middle ages it was advised that places for defæcation be made warm and comfortable. In the seventeenth and eighteenth centuries scammony, with its griping and anal irritation, was the favorite drug, in the early nineteenth century Abernethy with the everlasting "blue pill' mass and "black draught" came into vogue. Because of the misery these entailed, their use was abandoned and the intestines left to look after themselves.

Then came Metchnikoff who tried so hard to make us believe that the entire large bowel is useless to the human race. Working along these lines Lane with his brilliant surgery carried the profession almost off its balance. More sane *judgment prevailed, and the poor* old colon is not now sacrificed in the same ruthless manner.

There is a something in the right iliac region that passes for chronic appendicitis. This has been swallowed by the profession as an entity because there are recurring pain and tenderness often with nausea, there may or may not be constipation. A barium meal and X ray examination shows retention in the appendix up to 100 hours. The tentative diagnosis is confirmed, the appendix is removed but the patient is not cured! Why? Because, while there is a fibrosed appendix from repeated irritation, this is not the whole trouble. In about 3 to 6 months, the patient returns with the same symptoms, only a bit more exaggerated, and a further examination together with the X ray confirms the fact already suspected of adhesions. Another operation is advised and carried out and the surgeon is surprised to find so many adhesions, which he tears and pulls apart. He did not look for them the first time else the surprise would not be so great! Again the patient is well for a few months when those adhesions again form. What is the answer? Had the condition been gone into carefully in the first place one *would have* found that in addition to the pain tenderness, and nausea, the patient was easily upset nervously, was in a general state of ill health, with so-called indigestion, lassitude drowsiness in the afternoon, loss of appetite, and that while there might be nausea at any time, it was worse in the early morning and was

not necessarily associated with the pain A careful physical examination will, by careful palpation reveal a large flabby cæcum that just as one thinks he is about to grasp it, slips from under the examining hand An X-ray examination preferably enema will show an absence of haustra in the cæcum and ascending colon with retention in a cæcal pocket for days although the bowels may evacuate daily To clinch the diagnosis an opaque enema is given and with the X ray one sees the cæcum balloon and remain ballooned and then the barium begins to flow through the ileocæcal valve In one very pronounced case this enema was followed up the small bowel until a perfect duodenal cap was produced As a rule however one must desist by the time the duodenojejunal junction is reached because of the discomfort produced

How is the condition to be remedied? The removal of the appendix does no good The reconstruction of the ileocæcal valve is of even less value' One may bear in mind that the cæcum in these cases approaches the herbiverous type of bowel and that, therefore, some cases are benefited by eliminating meat from the diet In order to change the bowel flora, a piece of a yeast cake may be eaten night and morning Flaxseed added as an article of diet assists in securing daily bowel evacuations Abdominal massage is of great benefit and when in the upright posture the wearing of an abdominal lift corset.

Failing to get physical efficiency in this way In the early mild cases where the cæcum is still an abdominal organ, the removal of the appendix, combined with a plication of the cæcum after dividing with sharp dissection a constricting band at the junction of the cæcum and ascending colon over the outer leaf of the mesentery is probably all that is required When the cæcum is a pelvic organ and is in a similar early stage of atony, the removal of the appendix, with cæcal plication and then a burying of the plicated margin into a slit in the posterior parietal peritoneum serves a useful purpose.

In the advanced cases where the appendix has been removed and a series of adhesion breaking health breaking and heart breaking operations have already been done, nothing short of a radical resection of the terminal ileum and cæcum with an end to-end anastamosis of the cut ileum to the ascending colon or to the hepatic flexure as the case may require will be of any benefit.

There has been no mortality in the cæcal plication cases nor has there been in the plication and implanting cases and so far the results have been satisfactory

In the resection cases in 1920 we had twenty in which there were four deaths Of these deaths two had developed fæcal fistulæ, and two others had developed colon infection in the wound In the early months of 1921 we had 18 resections with one death, no fæcal fistula and two colon infections in the wound We attribute the improvement in results to the use of a piece of rubber tubing at the site of the anastomosis This is passed per rectum in from 5 to 17 days.

F N G Starr

MYOMECTOMY

ABOUT *12 per cent of white and 30* per cent of colored women of 50 years of age have uterine myomata. Fifty per cent of colored women of 35 years who have not borne children have such tumors. Only a small proportion of women with uterine myomata have symptoms and only myomata which cause symptoms require treatment, but all women who have myomata should be examined at intervals to see that the tumors are causing no harm

The most common conditions indicating operation are those which result from (1) hæmorrhage, (2) degeneration of the tumor (22 per cent), (3) malignant disease, usually carcinoma of the body of the uterus (4 per cent) 10 per cent of women more than 50 years of age who come to operation for uterine myoma have complicating malignancy, and (4) tumors causing pressure The great majority of patients who have tumors extending above the pubes belong to this group It has been shown that in 30 per cent of patients with myomata of the uterus which cause symptoms, the ovaries and tubes are seriously diseased and often require operation independent of the myomata

In about 5 per cent of our cases the diagnosis of uterine myoma was more or less clouded A tumor of the ovary, either benign or malignant, was usually the cause of the failure of differentiation especially when myomatous nodules, of no great consequence in themselves were coincident in the uterus

The use of the roentgen ray and radium in the treatment of disease is in many respects most encouraging In the treatment of myomata, radium has the advantage containing as it does definite and measurable quantities of γ rays which can be applied precisely

One cannot escape the conviction that in cases of myoma the use of radioactive substances is a most destructive method of treatment, non-operative, it is true, but certainly not conservative In the majority, if not all, of the cases in which rather large myomata disappear under their use, the patient loses the function of the ovaries, tubes, and uterus, although the non functioning remnants are left in place to await an uncertain future Many patients with small symptomless myomata are treated with radium on doubtful indications Radium has a great field of usefulness in the treatment of myomata For small tumors causing hæmorrhage in the menopause period, radium is the treatment of choice, and also for symptom producing tumors in obesity and certain constitutional maladies, but its use has definite limitations

Hysterectomy has been and still is the operation of choice for the greater number of symptom producing myomata and it has much to commend it. In patients more than 40 years of age, especially in whom the exact pathological condition is not established in every particular exploration followed if necessary by hysterectomy is the prudent procedure Supravaginal hysterectomy has a definite technique which has been so thoroughly and carefully worked out in the past 20 years that it has become the standard operation Preserving the cervix renders the operation easier and safer, but the cervical remnant has no function and some unfortunate propensities First, it leaves the patient with an average liability to cancer and, second it is usually the cause of those troublesome vaginal discharges called leucorrhœa, due to subsequent disease of the mucous glands of the cervix, and third, it may lead to greater vaginal shrinkage and tenderness For these reasons, total hysterectomy, provided it can be performed without undue risk, is the better operation.

We have been able to save at least one ovary in about one half of all the hysterectomies for myomatous disease. From the standpoint of conservation of the ovary, hysterectomy may be preferable to treatment by radium and the roentgen ray, since if myomata are effectively irradiated the ovaries are destroyed Acknowledging, as we must, the great benefits which have accrued to women through hysterectomy, we cannot blind ourselves to the physical and nervous changes which sometimes follow

especially in young women It would be interesting to know the percentage of di vorces that have had their origin in this operation.

To one who takes a view of the whole situation myomectomy must commend itself as a truly conservative procedure and often the operation of choice It has been urged against myomectomy that it is dangerous. From January 1 1891 to November 1 1921 909 myomectomies were performed in St Mary's hospital, with 7 deaths a mortality of 0 7 per cent. Again it is said that other myomata may develop In our experience only 2 per cent of patients came to hyster ectomy later and 60 per cent of these did not have recurrent myomata. We do not often perform myomectomy for patients more than forty If conditions are such as to make the operation relatively safe it is performed for patients from 35 to 40 years It is per formed for the majority of patients under 35 years and for practically all under 30 years Since symptom-producing myomata are much more frequent after the fortieth year it may readily be seen that we have been conserva tive in choosing cases

Myomectomy is more difficult to perform than hysterectomy because the technique must be varied according to the character situation size and number of tumors, but it does not present greater difficulties than can be easily mastered by the experienced surgeon Twenty three patients were preg nant at the time of operation 7 of the preg nancies were ruptured extra-uterine, and 16 were intra-uterine None of the patients died The majority of patients with intra uterine pregnancies following myomectomy went to term and were delivered of living children When it is considered that in the latter group the tumors were degenerating and causing acute symptoms, and that in a large proportion indications of spontaneous empty ing of the uterus were present at the time of the operation, it is remarkable that the disturbance subsided so often without pre- mature expulsion of the child In no instance in our experience with myomata complicating pregnancy have we been obliged to perform hysterectomy on the pregnant myomatous uterus with a non viable child

Five hundred four of our series of myomec tomized patients are traced Twenty four had had one child since the operation and seven had had two or more. Forty three living children following myomectomy on 504 pa tients only two-thirds of whom were married is a strong argument for the conservative operation

From this investigation of the actual results covering a period of 25 years it is evident that the operation of myomectomy has not re ceived the attention it merits. We should make every effort to improve the technique and further the indications for the operation It is the only truly conservative procedure for myoma of the uterus an operation which removes the tumor and leaves the patient as she would have been had she never possessed it.

WILLIAM J MAYO

CONSERVATION OF THE GALL BLADDER

FOR some years there has been a grow ing tendency to remove the gall blad der in all cases where operation upon it is indicated and the condition of the patient as a surgical risk does not contra indicate it The reasons for this are plausible but not convincing Has not the enthusiasm of the surgeon in favor of radical treatment got the better of his surgical judgment and caused him to overlook the just demands of the gall bladder for conservative treatment?

especially in young women. It would be interesting to know the percentage of divorces that have had their origin in this operation.

To one who takes a view of the whole situation myomectomy must commend itself as a truly conservative procedure and often the operation of choice. It has been urged against myomectomy that it is dangerous From January 1 1891 to November 1 1921 909 myomectomies were performed in St. Mary's hospital with 7 deaths, a mortality of 0 7 per cent Again it is said that other myomata may develop In our experience only 2 per cent of patients came to hysterectomy later and 60 per cent of these did not have recurrent myomata We do not often perform myomectomy for patients more than forty If conditions are such as to make the operation relatively safe it is performed for patients from 35 to 40 years It is performed for the majority of patients under 35 years and for practically all under 30 years. Since symptom-producing myomata are much more frequent after the fortieth year it may readily be seen that we have been conservative in choosing cases

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TRANSACTIONS OF SOCIETIES

CHICAGO SURGICAL SOCIETY

REGULAR MEETING HELD DECEMBER 2 1921, DR DEAN LEWIS PRESIDING

THE DIAGNOSIS AND TREATMENT OF SOME COMMON INJURIES OF THE SHOULDER JOINT

DR. ROBERT W LOVETT Boston Massachusetts, read a paper by invitation, on the diagnosis and treatment of some common injuries of the shoulder joint. (See p 437)

DISCUSSION

DR JOHN RIDLON I am glad to take this opportunity to admit that the difficulties encountered in treating injuries to the shoulder joint have always been more troublesome and more obscure to me than those in treating all the other joints put together It has been a great satisfaction to me to hear a reasonable exposition of the conditions such as we have heard from Dr Lovett.

DR. EDWIN W RYERSON Two points struck me very forcibly in this paper first, the question of neuritis I am beginning to believe that there is no such thing as a neuritis of the shoulder a neuritis of the sciatic nerve, or a neuritis of the lumbar region, so-called lumbago except in those cases where metallic poisoning or alcohol has had something to do with it I believe they are dependent upon some other condition. About 6 years ago when Codman's work was penetrating through my intellect I saw a woman who had a most intense and terrific pain in the right shoulder Treatment with heat and all other means that could be used for it gave no relief Distinguished neurological consultants saw her and advised the actual cautery which was applied, but it gave no relief and even made the pain worse An x ray picture showed a calcareous material which, when rubbed between the fingers gave the impression of little sharp crystals We are now told by some writers on this subject that this was probably not in the subdeltoid bursa but in the supraspinatus tendon sheath I do not believe that I believe it was a definite affair in the subdeltoid bursa Cases of this kind need operation. It is perfectly true that under conservative treatment especially with an abduction splint the deposit in the subdeltoid bursa may disappear with considerable rapidity but in this case operation was undoubtedly indicated.

A second point which I think ought to be mentioned is the fact that a subacute arthritis is very apt to occur in the shoulder joint. It may be rheumatoid or osteoarthritic in its nature and is more common than Dr Lovett has indicated in his paper This, of course has to be treated along general medical and surgical lines.

The lesions of the supraspinatus tendon are interesting I saw a gentleman a few weeks ago who in making a backhand stroke in playing tennis felt something crack in his shoulder and an x ray picture showed that a piece of bone at the insertion of the supraspinatus tendon was pulled loose He got well in 2 or 3 weeks with an abduction splint

Dr Lovett emphasizes the importance of putting up these cases in abduction No one should forget to do this in the somewhat obscure cases of shoulder joint lesions we see. It is comfortable except from a cosmetic standpoint, but there are some of these cases that should have the arm put up in that way instead of simply at the horizontal plane although that is much more comfortable

DR. D B PHEMISTER read a paper entitled Hematogenous Staphylococcus Infections in Various Organs Secondary to Skin Foci.

GROSS PROBLEMS FOLLOWING OSTEOMYELITIS OF ADOLESCENT LONG BONES

DR KELLOGG SPEED read a paper entitled Gross Problems Following Osteomyelitis of Adolescent *Long Bones* (See p. 469.)

DISCUSSION

DR. JOHN RIDLON I think a word might be said about simple fractures involving the epiphysis and the nutrient artery region lest it be assumed that simple fractures may result as do infected fractures

I have broken many bow legs, entirely disregarding the nutrient artery of the tibia, choosing the most favorable place to break the bone, and have never seen arrested growth from such a break I have broken the lower end of the femur as low down as possible many times for knock knees, ignoring the epiphyseal line, and I have also deliberately in a few cases taken off the lower epiphysis of the femur for the correction of knock knees, and

to the useless sacrifice of gall bladders that might be saved? Murat Willis, calling attention to the report of 397 cases in the Peter Bent Brigham Hospital, in which only 50 were non-calculous, deplores the fact that, of these 50 16 were normal gall bladders so that 1 patient out of 3 subjected to cholecystectomy for simple cholecystitis parted with a normal gall bladder the failure of the patients to obtain relief confirming the belief that the diagnosis of cholecystitis was a faulty one

Instead of saying then that the gall bladder should be removed except when contraindicated by the operative risk, would it not be better to reverse the formula and say the gall bladder should only be removed on account of definite crippling pathology which will preclude restoration to useful function? The removal of the gall bladder changes physiological relations, which should never be done without adequate reason. From the time of Sir William Ferguson conservative surgery has had a recognized place and our striving should be to prevent unnecessary mutilation Other organs have been removed without apparent detriment, but such removal without justification is crippling and should be discountenanced

F W Parham.

AMERICAN COLLEGE OF SURGEONS

FEBRUARY MEETINGS OF STATE SECTIONS OF THE CLINICAL CONGRESS OF AMERICAN COLLEGE OF SURGEONS

GROUP meetings of the American College of Surgeons were held during February in five group centers Lincoln, Nebraska, Kansas City Missouri Los Angeles, California, Houston, Texas, and Memphis Tennessee.

The meetings carried the usual two-day program clinics in the forenoons of two consecutive days hospital conference the afternoon of the first day, public gathering the same evening, and the scientific session the afternoon of the second day

The speakers from the central office were Dr Franklin H. Martin director general of the College Dr George W Crile, a regent of the College, Mr T E Allen and Mr R.I Raymond The Rev C B Moulinier, S J president of the Catholic Hospital Association, attended and addressed all meetings.

Meetings in Lincoln for the states of Iowa, Nebraska, and South Dakota were held February 6 and 7 under the chairmanship of Dr A. R. Mitchell of Lincoln, at the Lincoln Hotel and at the City Temple Auditorium There were 76 Fellows in attendance and the local clinics were well filled. About 250 attended the hospital conference, 1,000 were present at the public meeting, and approximately 200 met at the scientific session.

The meetings for the Missouri and Kansas sections were held February 9 in Kansas City at the Baltimore Hotel and the Grand Avenue Temple. Dr Daniel Morton, counselor presided in the absence of Dr John F Binnie, chairman.

The clinics carried heavy programs and were well attended. About 125 Fellows were present at Kansas City and their number was heavily reinforced by the attendance of the local medical fraternity There were about 400 present at the hospital conference, a good gathering at the public meeting and about 250 at the scientific session.

The group meeting for Arizona, California and Nevada was held February 17 and 18 in Los Angeles, under the chairmanship of Dr Stanley Stillman. The work of the local committee was facilitated by the convenient arrangement of having all meetings in the Alexandria Hotel where sufficient accommodations could be afforded.

One hundred and twenty two Fellows were in attendance. The College had the pleasure of entertaining Judge Harold M Stephens of Salt Lake City who spoke at both the hospital conference and the public meeting

The hospital conference drew nearly 350 the public meeting about 900 and many were turned away The scientific session was attended by more than 400 many of the local surgeons and doctors being present.

The Houston meeting February 23 and 24 included the sections for New Mexico, Oklahoma, and Texas. Dr Bacon Saunders presided

Ninety four Fellows were in attendance, and at this group meeting the College had the cooperation of the Harris County Medical Society This co-operation, as was evidenced at the St. Paul meeting in January, proved a helpful arrangement and one desirable to have hereafter wherever possible.

The clinical meetings in the forenoon of both days had an unusually good attendance, doubtless due to the participation of the members of the Harris County Society

The hospital conference was fortunate in being addressed by Mr Robert Jolly, superintendent of the Baptist Hospital of Houston whose inspirational talk to the hospital people was of notable value. About 200 attended.

The public meeting was held at the First Presbyterian Church, and the speakers had the pleasure of addressing a thoroughly packed house of about 1200

The scientific session was attended by more than 200 including a large number of the Harris County Medical Society

The Tennessee, Kentucky and Arkansas sections met in Memphis, Tennessee, February 27 and 28 under the chairmanship of Dr W A Bryan. The activity of the local committee here was particularly evident in drawing out an excellent attendance to the meetings under un

favorable weather conditions. One hundred and seventeen Fellows were registered in Memphis.

The hospital conference at the Chisca Hotel, in addition to the regular speakers, listened to an address by Dr W R Bethea, in which he covered the necessities of hospital administration and very excellently interpolated the use and value

Hotel with 250 present.

The above necessarily brief résumé is altogether inadequate to present the effective activities of the local and sectional committees and the cordial interest of the local physicians and surgeons Least of all does it convey the widespread interest on the part of the general public in the work of the College in the standardization of hospitals and scientific medicine.

It is increasingly evident that the state executive committees are effectively intent in thorough organization within their own states and are helpfully co-operative one with another in the group meetings under the auspices of the committee for the host state When the difficulties of travel hotel reservations, location of headquarters and meeting places for committees and open meetings are all taken into consideration

tees in the cities entertaining the sections It has been the usual experience that every facility to lighten the necessary burdens of these gatherings has been provided long before the arrival of the Fellows of the College and the representatives from the central office

A significant and helpful feature throughout has been the presence and interest of the local physicians and surgeons who are not members of the College It is evident that the meetings have in some definite measure fulfilled their obligation of carrying the message of the College to them

It is the purpose of the group meetings to present hospital standardization to all the hospital people who may be brought to them and certainly a large measure of commendation is to be accorded the trustees, superintendents, staff members, internes, and nurses who have availed themselves so interestedly of the message of these meetings.

An element of increasing importance in the sectional gatherings is the presentation to the public of the definitely three-fold program hospital standardization, the aims of the college toward the furtherance of best surgical service to the public and the safeguarding of public health, and, lastly the place of scientific medicine and the need for the co-operation of the laity in its furtherance.

That these points already are of general interest to the citizens of these fourteen states is indicated by the voluntary lay attendance at the public gatherings Their interest has been not one of curiosity but of definite search for information. It is evident that the public is anxious to know more of hospital betterment in order to utilize this information it is interested in scientific medicine in order to avoid unscientific medicine, and to assist with its influence in the furtherance of real research at the cost of sentimental prejudice

cation. It is to be hoped that this appreciation will express itself in the furtherance of the College program for the safeguarding of public health through local, civic, county and state lay organization. Definite work toward this end is much to be desiderated, both through the suggestion as to the objects that may be accomplished by the laity and the methods, possibly through which organization to this end may be effected in a purely civic way

SCHEDULE OF SECTIONAL MEETINGS FOR 1922

Pennsylvania, Delaware, and New Jersey at Allentown-Bethlehem Pennsylvania, April 3-4

Quebec at Montreal, Quebec, May 11 12

New England States at Portland, Maine, May 15 16.

Nova Scotia, New Brunswick, and Prince Edward Island, at Halifax, Nova Scotia, May 19-20.

APRIL, 1922

International Abstract of Surgery

Supplementary to

Surgery, Gynecology and Obstetrics

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INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1922

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Mosskalenko, W W: The Anatomo-Mechanical Bases of Drainage of the True Pelvis (Die anatomisch-mechanischen Grundlagen der Drainage des kleinen Beckens) *Inaug Diss* Petrograd, 1921

(1) the operative procedure used for the introduction of the drainage tube and (2) the topography of the pelvic organs.

Mosskalenko discusses from the standpoint of anatomy all the proposed operative methods of effecting drainage and describes the variations of the organs of the true pelvis having an influence on the evacuation of fluids. The cadavers studied were hardened with a 10 per cent solution of formalin. By control experiments it was determined that such hardening does not cause displacement of the organs. The outline of the sacrum and the organs of the pelvis were reproduced on glass in their natural size and position, and in this manner a series of drawings showing the topography of the pelvic organs was obtained.

The cadavers of forty three men fifty-six women and thirteen children were examined. In addition, dogs were dissected. The author gives a detailed description of the aponeurosis of Denonvillier the posterior and lateral pelvic wall, the pelvic floor and the topography and variants of the rectum, bladder, urethra, prostate, vas deferens, uterus, vagina and pelvic peritoneum. On the basis of all the variants certain topographical types of pelvic organs were determined. In his review of the literature the author quotes 311 authors.

The aponeurosis of Denonvillier is of great importance as it indicates the topographical peculiarities of the pelvic organs. It may be either vertical or oblique i.e. it may lie nearer the symphysis or nearer the os sacrum. Its position is related to the topography of all the pelvic organs. Mosskalenko differentiates two types of topographical position of the pelvic organs (1) the symphysopetal type in which they lie near the symphysis and (2) the sacropetal type in which they lean toward the sacrum. In the symphysopetal type the aponeurosis of Denonvillier is inclined against the symphysis, while in the sacropetal type it is inclined toward the sacrum.

On the basis of comparative anatomy one must regard the sacropetal type as the perfect type and the symphysopetal type as the imperfect type. Each of these types points to certain peculiarities in the construction of the individual pelvic organs and is of great importance in the choice of an operative method. In the sacropetal type the route to the prostate, seminal vesicles, and uterus through the anterior abdominal wall is very disadvantageous as the organs lie deep in the true pelvis. The route through the perineum or through the vagina is easier as the organs lie nearer these routes. The topographical type is of importance also in catheterization of the male urethra. In extreme cases of the sacropetal type the catheterization must be undertaken with a slightly bent catheter while in cases of the symphysopetal type the catheter must be decidedly bent. In extreme cases of the sacropetal type the prevesical peritoneal fold lies under the symphysis and high section is difficult to perform without injuring the peritoneum.

The presence of the symphysopetal or the sacropetal type and the position of the aponeurosis of Denonvillier can be ascertained by the ordinary measurement of the pelvis. The conjugata vera is determined in the usual manner. When this is more than 11 cm. and the anteroposterior diameter is more than 11.5 cm. the pelvic topography is of the horizontal line of the pelvis in the vertical position. The angle of 55 degrees indicates the angle of pelvic

imately 113 degrees In 61 per cent of cases it is

spines of the ilium divides the sacrum into two parts In the extra articular type of sacrum the extra articular or lower portion forms the greater part and the articular surface lies above the third sacral foramen The form of the sacrum is very complex

With regard to the pelvic floor the author carefully studied the topography of the ischiorectal

kalenko found two types of rectum the ampullar and the cylindrical In the first the ampulla is highly developed In the second it is not pronounced and the intestine therefore assumes a cylindrical form The ampullar or perfect type is generally found in man The type may be determined by measuring the distance between the anus and the coccyx When this distance is less than 3 5 cm the *rectum is usually of the ampullar type* and when it

the rectum deviates in the direction of the sacral foramen, but when the sacrum is asymmetrical the rectum lies on the opposite side from the displaced sacral foramen

When the inclination of the aponeurosis of Denonvillier is more than 113 degrees the fundus of the bladder is low but when the inclination is less than 113 degrees the fundus of the bladder will be found

thra with a curvature very pronounced situated chiefly in the bulb and a shorter fixed segment—the sharply bent urethra The curvature of the urethra

ation corresponds to that of the aponeurosis of Denonvillier The lower border of the peritoneal

angle is greater than 113 degrees it is situated high The vesico-uterine pouch is wide when the aforementioned angle is greater than 113 degrees The vesicorectal pouch exhibits the same peculiarities

The second part of the monograph is devoted to experimental clinical research Mosukalenko describes the contour of the pelvic reservoir in certain

pouch) and discusses the peculiarities of the distribution of fluids in the true pelvis under certain mechanical pathologic and clinical conditions (the influence of the position of the body the topography of abscesses of the posterior portion of the Douglas pouch the distribution of the fluid in ascites, cysts of the posterior portion of the pouch of Douglas ovarian tumor and the distribution of the fluids following certain operations on the pelvic organs such as extirpation of the uterus or bladder

Attention is given also to the drainage of the true pelvis from the standpoint of surgery and gynecology Mosukalenko distinguishes (1) perineal and (2) sacral drainage For perineal drainage a slanting position of the body is best Fowler's position or the semi-sitting position of Fedoroff Fowler's position is of value however only when the pelvic topography is of the symphysiopetal type while Fedoroff s position gives equally good results in both the symphysiopetal and the sacropetal types *Of all types of perineal drainage the rectal is best* for males and the vaginal for females Of all meth

sence of clinical indications regarding the method of draining the true pelvis the choice must be based upon the anatomy In the symphysiopetal type of pelvic topography the rectal or vaginal method must be employed in the sacropetal type the coccygeal

The monograph contains several case histories illustrating the author s points, 292 illustrations, and protocols of the experiments Wagner (Z)

SURGERY OF THE HEAD AND NECK

HEAD

Wilensky A. O.: The Neurological Manifestations of Fracture of the Skull (Craniocerebral Injuries). *Surg. Clin. N. Am.* 1921, 1, 1709.

A simple fracture of the skull is a relatively benign lesion, but when associated with trauma to the underlying brain it becomes more serious.

The extent of a head injury may vary within wide limits. There are cases in which the wound is of comparatively small size and others in which the entire skull is cracked like an eggshell. With bony injuries of such varied nature and extent the associated intracranial injury may show a similar diversification. The injury may be limited to a single cranial nerve or to a venous sinus or to a localized and comparatively small area of contused brain tissue, while in other cases the entire brain may be disorganized more or less completely. The latter type of injury is immediately fatal.

The lesions in the brain may consist of numerous small contusions localized in a single area or widespread throughout the major portion of the brain. In more extensive lesions there are one or more lacerations in the brain tissue in addition. In others the surface of the brain cortex loses its normal morphology and is replaced by a mass of grumous blood stained semisolid material resulting from the complete disorganization of the normal structure. In extreme cases the entire brain is involved.

Perceptible lesions in the brain may be produced by pressure from without either by a depressed fragment of bone or the pressure of a large blood clot. As a rule the accumulated blood clot gathers over the surface of the brain either between the dura and the bone (subdural) or directly over the cortex (subarachnoid). In other cases it is situated in the midst of the brain tissue either at the bottom of a deep laceration or independent of the latter.

A less common cause of neurological disturbance is interference with the blood supply of some portion of the brain either by pressure upon an important blood channel especially the longitudinal sinus, or by thrombosis or both.

It is not necessarily true that the subjacent brain injury will lie in anatomical relationship to the area of fracture.

In about 40 per cent of persons with head injuries sustained in civil life no abnormal neurological find-

contusions and lacerations in which fracture of the skull is not suspected but is subsequently demonstrated by X-ray examination (these make up the largest number) and (2) cases with such quickly disappearing symptoms that by the time the patient reaches the hospital (usually within an hour) the signs of neurological disturbance no longer persist.

The symptoms produced by brain injuries associated with skull fracture may be classified into two groups. One group is composed of general symptoms related to the brain as a whole and not referable to any one area that can be differentiated. This group has two subgroups. In the first subgroup the general symptoms reflect a general or diffuse interruption of brain function are associated with the primary general contusion and initial hyperstimulation of brain substance and are related particularly to the primary unspecialized functions of the brain. In the second subgroup there is a general and progressively increasing intracranial compression. The second large group of cases in which neurological disturbances are present are those in which the signs indicate that only a localized area of brain or nerve tissue is involved.

The typical signs of progressive intracranial compression following an injury include (1) progressive in the later stages by dilation and (6) Cheyne-Stokes breathing. Other neurologic symptoms and signs may coexist. The danger signs include (1) very slow pulse and respiration (2) low blood pressure and (3) dilated pupils. These are the signs which indicate medullary involvement.

It is very important to be able to recognize cases of compression which are due to œdema alone inasmuch as in these operation is not suitable or is of no avail and may possibly do harm. When intracranial compression is due to œdema spontaneous recovery may result.

Symptoms indicating injury of an area of brain or nerve tissue that can be differentiated—that is focal symptoms—may be referable to any part of the body they are present in from 20 to 25 per cent of the cases.

Among the cranial nerves the facial and auditory are most often the site of disturbance after craniocerebral injuries and complete recovery does not always follow.

Focal signs referable to the extremities are most common. In general they may be grouped as those characterized by paralysis and those which are signs of cortical irritation. It must be borne in mind that frequently symptoms of the latter nature which are present immediately after an injury are due to the stimulation of the initial violence and are only temporary phenomena. One should wait a sufficiently long time to make sure that they are established symptoms before accepting them.

Focal symptoms indicating irritation need not necessarily be limited to any one extremity. Focal symptoms of a paralytic nature are classified as regards the number of extremities involved as monoplegias, diplegias and hemiplegias. In the majority

of cases paralytic symptoms are due to some form of pressure upon the cortex

often is associated with injuries in the paracentral lobules or in the convolutions bordering the fissure of Rolando thrombosis of the sinus is frequently found

The proper course of treatment for craniocerebral injuries should be determined on the basis of the average results obtained with the conservative and operative forms of treatment Wilensky has found that the mortality of conservative treatment averages approximately 27 per cent He summarizes his ideas regarding treatment as follows

1 Conservative and expectant methods of treatment under proper conditions yield the best results

2 Operation is imperative in every case of advancing intracranial pressure and should be done in the early stages before there is evidence of medullary involvement

3 Irritation or paralytic focal symptoms pointing to pressure upon or disorganization of definite cortical areas are the next most important indications for operative intervention In cases of this type operation is very seldom as urgent as in cases of the second group

In the author's experience lumbar puncture has not given complete satisfaction as a therapeutic measure In mild cases of intracranial compression the release of cerebrospinal fluid has been followed by symptomatic relief of slight or moderate degree but in other similar cases the ultimate result has not differed from that obtained when no such procedure was used MARGARET I MALONEY

Basilio, M : Decompressive Craniectomy by Parlavecchio's Method (Craniectomia decompressiva col metodo del Parlavecchio) *Policlin* Roma, 1921, in sez chir 5 5

The author states that prevailing surgical opinion favors opening of the dura in a one-stage decompressive craniectomy

Parlavecchio has operated upon numerous cases of essential epilepsy by his method of decompressive trephination In one case in which he did not open the dura the operation was without benefit In

the methods of decompressive craniectomy in present use. Lannelongue's method does not open the dura Kocher's favors cerebral hernia Stoppato's method will be unsuccessful unless the superimposed bone disc becomes consolidated with the external table. Parlavecchio's operation, he believes, is preferable to any other In this procedure a horseshoe incision is made in the temporoparietal region with its base downward The flap is cut deep freed from the bone and turned down. An opening 2 or 3 cm square is then made in the cranium with the electric saw directed by Parlavecchio's special saw guide the craniectomy is completed by a few strokes of the scalpel, and the bone is removed Hemostasis of the diploe is obtained by the usual methods With the bistoury

craniectomy These strips are turned over to the outside and sutured to the neighboring pericranium The external flap is then replaced and sutured, only a strip of gauze being left for drainage The gauze is removed the second day

This method forms a permanent decompressive valve The portion of bone removed need not measure more than 3 by 3 cm W A BRADHAM

Anwyl-Davies, T : Tumor of the Right Petrous Bone. *Lancet* 1921 cci, 1323

The patient whose case is reported was a man aged 47 years, who had been losing weight and becoming deaf for one year Ten months previous to examination he noted a small lump in the right side of the neck near the angle of the jaw Pain soon developed and gradually extended up the neck and over the right side of the scalp and forehead About a month previously he developed diplopia, which was soon followed by drooping of the right eyelid He noticed also anesthesia of the right side of the face and began to have severe headaches and insomnia

Examination revealed complete paralysis of the third, fifth, and sixth cranial nerves and partial paralysis of the first fourth, eighth, ninth, tenth,

medulla near the nucleus of the fifth nerve, the cerebellopontine angle, and the petrous portion of the temporal bone That a medullary growth was *not responsible was indicated by the absence* of interference with the centers controlling the heart, respiration, temperature, and sugar metabolism The absence of a lesion of the cerebellopontine angle was indicated by the absence of severe headache vomiting, optic neuritis, and symptoms of cerebellar pressure such as nystagmus, ataxia, weakness, and vertigo

It is pointed out that a growth, at most 1 in. in length which extends backward from the apex of the petrous bone, may affect all the cranial nerves except the second and twelfth In this case only the second, seventh, and twelfth nerves had escaped The immunity of the seventh was due probably to

its superior powers of resistance and the fact that it lies on the eighth nerve and is separated by it from the bone.

Several possibilities as to the nature of the disease were considered, viz sarcoma, carcinoma gumma tuberculosis, enchondroma, a fibroid growth and a hydatid cyst. The glands of the neck seemed to indicate malignancy particularly carcinoma be cause of the relatively slow rate of growth The treatment could be only palliative and the prognosis was extremely poor H E. Boxer M D

Gamberini C.: The Treatment of Traumatic Epilepsy (Trattamento dell epilessia traumatica) *Riforma med* 1921 xxxvii, 1170

The author has been able to collect seventy-one cases of cranial injury treated by operation. Epilepsy developed in forty four (61 97 per cent) In thirty four it developed immediately or soon after the injury and in ten two or three years later In six of the cases of epilepsy the injury occurred in the frontal region (dura intact in one cerebral lesions in five) In thirty four it occurred in the central cranial region (dura intact in six cerebral lesions in eighteen) and in four it occurred in the occipital region.

In six cases of wounds with a cranial breach the epilepsy was treated by simple denudation without cranioplasty This caused improvement recovery and late disappearance of the epilepsy in three cases respectively but failed in two cases.

In three cases the cranial defect was repaired In one case there was no improvement but in the two others recovery resulted.

Treatment by excision of the wound in the first stage and a cranioplasty performed from a few months to two years later in seventeen cases re sulted in recovery in eight, improvement in four and failure in two In three the epilepsy recurred late.

The total number of cases of epilepsy operated upon was thirty three Of these, fifteen were cured five benefited, and thirteen not benefited Twenty seven of the operations were cranioplasties fourteen resulted in a cure five caused improvement and eight had no effect

Sixteen cases of cranial lesions with nervous disturbances not true manifestations of epilepsy were treated by cranioplasty Two were not benefited, but in the fourteen others there was improvement or disappearance of the condition. Of eight cases not treated by cranioplasty the condition remained unchanged in six and became improved in two

There were twelve cases of generalized epilepsy twenty five cases of Jacksonian epilepsy and seven cases with nervous phenomena resembling those of epilepsy

In every case of cranioplasty except one the author has used autoplastic grafts. He draws the following conclusions

1 In cases of traumatic, Jacksonian and general epilepsy removal of the recognized or presumed

ral scar
combat

2 In these cases cranioplasty is also necessary Even in the absence of recognized anatomical causes for the crises, the cranial decompression has a direct value as it often cures the epileptic disturbances

3 The best results in the repair of extensive defects of the cranial vault are obtained by the method of autoplasty in which a reversed osteoperiosteal strip is used W \ Brennan

Hagemann J A.: An Unusual Instance of a Foreign Body Penetrating the Head *J Am M Ass* 1921 lxxvii 2053.

The author reports the case of an Italian who was stabbed in the left temple The weapon a flat file ground to a keen edge on one side and to a sharp point at the end entered the left side of the head about 3 8 cm behind the external canthus and about 1 3 cm above the zygomatic process of the malar bone The point pierced the temporal muscle and the great wing of the sphenoid bone traversed the floor of the orbit, penetrated successively the left ethmoid bone, the nasal septum and the right ethmoid bone and projected about 10 mm into the postero-superior portion of the right maxillary sinus At a point on the floor of the left orbit the blade broke and the section nearer the handle was extracted or fell out. The presence of the pointed end of the dagger was not suspected until it was revealed by the roentgenogram This piece was successfully removed at operation by approaching it from below through the antrum

Frederick Christopher M D

Goljanitzki I A. Cases of Extraction of Foreign Bodies (Projectiles) from the Brain (Faelle von Extraktion von Fremdkoerpern (Projektilen) aus dem Gehirn) *Sitzungsb d Saratower chir Ges* 1920.

Following a short review of the literature the author reports three cases of extraction of projectiles from the brain. In the first case a shrapnel wound had been sustained eleven months previously Immediately after the injury there were no symptoms but subsequently the patient experienced pain in the left side of the head during motion and agitation, and especially on bending down No objective changes in the nervous system were apparent The cicatricial wound of entrance of the shot in the upper region of the forehead to the left of the midline showed a slight depression of the bone By means of roentgenograms taken in two directions, the foreign body was located in the occipital region 2 cm to the left of the midline, at a depth of 1 cm from the lamina vitrea and on a horizontal plane with the external occipital protuberance and the middle of the left zygomatic arch. After osteoplastic exposure of the occipital region and palpation of the shrapnel ball in the brain just over the tentorium the ball was extracted

through a small incision The postoperative course was smooth, and the patient recovered

The complaint in the second case was headache There were no other nervous symptoms The X-ray showed a bullet in the left occipital region just over the transverse sinus, 4 cm from the mid line and 3½ cm from the bone After osteoplastic exposure the bullet was felt by the finger just under the brain surface and extracted through a small incision The patient was discharged well

The third case was that of a man who was shot in the right eye three and one-half months previously

cranial fossa at the upper border of the right pyramid An osteoplastic trephination was done over the right temporoparietal region the flap was reflected with a blunt hook and a finger pushed along the anterior surface of the pyramid The bullet was indistinctly felt almost at the tip of the pyramid deep in the brain substance about 2 cm from the surface By dull dissection the tip of the finger was inserted into the brain substance and the bullet extracted Six days after the operation the patient was unconscious and on the seventh day flaccid paralysis of the right extremities developed After one and one half months, however he was discharged with only slight weakness of the affected extremities

On the basis of his observations, especially the last case, the author draws the following conclusions

1 Even in the absence of all symptoms, the

body is only relative as even when the position of such a body is known exactly it may be necessary to approach it by a very indirect route if injury to important structures (ventricles and vessels) is to be avoided

3 The best and most generally used aid in locating a foreign body is the roentgenogram taken in two directions

4 Superficial and deep palpation of the brain with the finger is one of the most delicate methods of searching for foreign bodies in the brain.

ROSENKRANTZ (Z)

Gamble, H J. The Treatment of Brain Injuries. *Internat J Surg* 9 xxxv 429

After remarks on the pathologico-physiological changes induced by trauma to the brain the author classifies cranial injuries into three groups (1) those due to concussion (2) those due to compression, and (3) those due to contusion

Clinically the orderly sequence of symptoms usually described as characteristic of increased intracranial pressure is not always present Marked manifestations of cortical excitation may be present in an advanced and serious condition There may be focal paralysis even with a high degree of intracranial pressure

The most certain diagnostic symptoms of increased intracranial pressure are (1) an increase in the spinal fluid pressure (2) a progressive rise in the blood pressure (3) a progressive slowing of the pulse Other conditions indicating cranial injury are focal symptoms the eye-ground appearance bleeding or loss of cerebrospinal fluid from the ears or nose orbital hemorrhage and the local appearance of the area of trauma

The author warns against delaying operation when the three symptoms previously mentioned are present and reports the histories of two cases in which death was due to such delay Operation should not be performed during profound shock or delayed until a falling blood pressure rapid pulse and Cheyne Stokes respiration indicate approaching death

Operation is indicated in cranial injuries for the relief of pressure the control of hemorrhage, the removal of foreign bodies, and the prevention of infection The operative site is determined by the local wound or focal symptoms If both are absent a subtemporal decompression is best to find the hemorrhage and to drain the middle fossa

Very important points in the operative technique are the wide opening of the dura for its decompressive effect after evacuation of the clot and elevation of the bone and in cases of extensive trauma the establishment of drainage In the author's opinion removal of the bone flap is not necessary to obtain decompression of the opened dura

Compound fractures of the skull should be operated upon as soon as the patient's condition will permit When there is marked damage to the brain tissue the wound must be left open to provide the

description of

Gamble prefers local anesthesia preceded by morphine and scopolamine if the patient is not already in a stupor

The mortality of 50 to 60 per cent can be reduced by earlier recognition of the symptoms and improved technique

of operation, one from brain abscess, and one from extensive destruction of brain tissue. Of the fourteen patients not operated upon, eight had symptoms of concussion possibly of contusion, but had no symptoms of increased intracranial pressure three had a fracture of the base without pressure symptoms two died from extensive brain injury and one died with symptoms of compression in the cerebellar region.

The most frequent complications aside from the loss of function of the damaged brain tissue are meningitis brain abscess and cerebral hernia

WALTER C. BURKET M D

Izquierdo M A Case of Atypical Cerebral Localization (Un caso de atipia de localización cerebral) *Rev méd de Sevilla* 1921 vl 18

The case reported was that of a man 40 years of age who had facial and ocular motor paralysis and trigeminal neuralgia A peripheral lesion was suspected as the symptoms of a central lesion would have been more complex. The lesion was believed to involve the aqueduct of Silvius and the fourth ventricle As the patient s history suggested syphilis he was placed on specific treatment Death occurred suddenly from cerebral hemorrhage several days later

The autopsy disclosed a large hemorrhagic focus in the aqueduct of Silvius on the right side. The meninges of the brain were held by temporal and parietal adhesions and the cerebral substance of the temporal lobe was softened.

While the ocular motor paralysis is easily explained by the softening of the temporal lobe and the meningitis, no explanation could be found for the absence of symptoms attributable to the destruction of the temporal and parietal lobes

lesion or some inhibitory action must be necessary for loss of function W A BRENNAN

Spaar E. C.: A Case of Bilateral Cerebellar Abscess with No Localizing Symptoms. *Indian M Gaz* 1921 lvi 451

The patient was a Singhalese girl 8 years of age who was admitted to the hospital January 17 1921 in a semi-conscious condition with a history of fever of six days duration and inability to speak The child had been in perfect health until two months previous to admission, at which time she had a fall That night she was inclined to be quiet and complained of vague pains all over the body but more marked along the spine and in the neck. She slept during the entire next day though she complained of no discomfort Under native treatment she was restored to her usual health in ten days

A month later certain peculiarities in disposition became noticeable. She was easily irritated cried

the six days prior to her admission to the hospital she had fever In the evening no definite information could be obtained as to any rise in the morning

During this period she was extremely irritable shunned bright objects closed her eyes doubled her body supported her head with her hands and cried frequently that her head was being crushed She complained also of a bitter taste in her mouth There was no chill rigor, or fit before or during the attack of fever When the temperature dropped in the morning she moved about comfortably though with the spine and neck held rigid On the morning of her admission to the hospital she rose from bed at about 5 o clock and kept looking at the roof Suddenly she called out, held her head with her hands, vomited once, and fell unconscious Her body was held rigid and doubled up and her neck was retracted and stiff

On examination the patient was unconscious with the head retracted the eyes partially closed and the extremities cold The pupils were dilated and there was a tendency to conjugate deviation of the eyes to the right with slow nystagmoid movements and external strabismus The knee jerks were exaggerated and ankle clonus and the Babinski sign were present The femoral glands were tender but not enlarged Rales were heard over the bases of both lungs. The heart was normal

A diagnosis of tuberculous meningitis was made By lumbar puncture 25 c.cm of slightly turbid fluid were removed This contained a trace of albumin and a few lymphocytes and polymorphonuclears

The patient died January 21 Postmortem examination showed tuberculous abscesses in both the lobes of the cerebellum One was extensive, occupying the greater part of the left lobe Miliary tubercles were found about both sylvian fissures and in the left temporosphenoidal lobe The lateral ventricles were much dilated and filled with cerebrospinal fluid

The remarkable feature of this case was the absence of symptoms indicating cerebellar abscess. The decubitus in the early stage of the illness was characteristic of tuberculous meningitis—Stocker s sign Instead of paresis of the limbs there was rigidity The paralysis of the sixth cranial nerve was a sign common to tuberculous meningitis as well Ev
such a v
abscess
duration the presence of the meningitis, and the loss of consciousness which rendered more definite

ges, although the presence of several classical symptoms in the latter part of the period might have suggested the nature of the illness to a careful observer

2 The very abrupt onset of the terminal stage of the disease with vomiting and sudden loss of consciousness

3. The temperature which steadily rose from the time of the patient s admission to hospital until her death.

4 The probable absence of a primary focus for the tuberculous meningitis The bronchial and mediastinal glands and the lungs were normal The middle ears were not examined, but there was nothing to suggest middle-ear disease

MARGARET I MALONEY

Linck The Clinical Aspects and Pathology of Brain Abscesses (Beitrag zur Klinik und Pathologie der Hirnabscesse) *Deutsche Zeitschr f Chir* 1921 clxvi 65

Linck reports three cases of otitic abscess and one case of traumatic abscess of the brain, in two of which death occurred after operation

In cases of depression fractures with shattering of the brain and opening of the cranial cavity it is easy to determine the cause of the abscess, but otitic sources are more difficult to discover In the latter type of case consideration must be taken of (1) extension of the infection by continuity (2) the development of the abscess as a metastasis through the blood or lymph stream and (3) indirect metastasis through the general circulation As a rule the infection is spread by way of the second route being conveyed by the pia and mastoid veins The fact that our knowledge regarding the relationship of the vascular system of the endocranium with the base of the skull is still very imperfect adds to the difficulty in coming to any conclusion A true abscess membrane is not necessarily a sign that the process has limited itself Rupture of this membrane may occur at any time and lead to diffuse encephalitis

An abscess that lies in a so-called silent region is

importance for it is certain that a lymph stream runs from the neighborhood of the abscess to the ventricle, and from the presence of pathologic constituents in the fluid one may draw conclusions as to whether the abscess is limited by a membrane or surrounded by a zone of encephalitis From the presence of a choked disk conclusions may be drawn as to the site of the lesion

The treatment presents the following problems (1) the removal of the original focus (2) the discovery and removal of the abscess cavity (3) the emptying and care of the abscess cavity In the search for the abscess a syringe with a thick needle is used The author has discarded the usual method in which the abscess is opened with the scalpel, dressing forceps are introduced and their blades spread, and a drain is inserted blindly He proceeds with greater care. Close to the puncturing needle he tears the dura advances a Lucae bayonet forceps

speculum is continued until the cavity is lined with healthy granulations and reduced in size. This method is useless and impossible when marked oedema and progressive encephalitis are present.

FISCHER (Z)

Neuhof H: Giant Endothelioma of the Medulla: Suboccipital Craniotomy and Removal of the Arches of the Atlas and Axis under Local Anesthesia. *Surg Clin N Am* 1921 I, 1693.

The case reported was that of a woman, 38 years old who had persistent occipital headache progressing paralysis of the extremities, bladder disturbance and dyspnea

Physical findings of importance were atrophies and paralysis of all four extremities, more marked on the right side absence of the superficial reflexes marked reduction of the deep reflexes a decrease or loss of sensation over the entire body except the face and anterior half of the scalp limitation of motion of the

headache loss of sensation, quadriplegia, and the presence of a rounded prominence in the region of the second and third cervical vertebrae which could be felt through the pharynx

The X ray is apt to be deceiving because if it shows arthritis or exostoses it may lead to the conclusion that these are the cause of the symptoms noted

In the case reported operation was undertaken to relieve the impending respiratory failure which contra indicated general anesthesia Novocaine was used

The patient was placed in the prone position with the shoulders up to the end of the table and her head supported in the lap of an assistant A cross-bow incision was made as for a suboccipital craniotomy The lower part of the occipital bone the posterior three-fourths of the rim of the foramen magnum and the arches of the atlas and axis were removed The bleeding is less profuse under local than under general anesthesia.

When the dura was incised, considerable spinal

upper cord far over to the left. The major part of the tumor extended in front of the medulla and upward under the cerebellar lobes and could not be removed without further damage to the medulla

radium needle was hooked into the growth to be removed later by means of the attached thread The dural incision was left open and the wound closed by layers

every two or three days and the tamponade by

There was no postoperative shock, but respiration ceased after thirty six hours and the pulse ten minutes later

At the postmortem examination the tumor was found to measure 3 by 4 by 5 cm and to be attached to the dura anterior to the medulla. Pathologic examination showed it to be an endothelioma.

MARCUS H HOBART M.D

Dandy W E.: The Treatment of Brain Tumors. *J Am M Ass.*, 1921 lxxvii, 1853

The points in this article may be summarized as follows

1 Brain tumors are among the most frequent neoplastic lesions their growth is always progressive and usually leads to grave sequelæ and eventually to death

2 There is only one form of treatment for tumors of the brain i.e operative removal and this must be complete

3 To obtain the best operative results. brain tumors must be diagnosed and localized in their earliest stages

4 It is now possible to diagnose and localise practically every tumor in its early stages. When all other signs and symptoms fail, cerebral pneumography will make the diagnosis and localization accurate precise localization The approach should afford adequate room, and should be directly over the tumor

6 After correct localization all brain tumors should be disclosed at operation.

7 Every effort should be made to effect a cure by complete extirpation of the growth The mortality of carefully performed extirpations is lower than that of unsuccessful explorations When it is impossible or unjustifiable to remove the tumor the maximum palliative relief should be given at the same operation

8 Decompressions routinely performed are among the most harmful and indefensible operations in surgery They should never be performed for unlocalizable tumors In such cases they are equal to the administration of morphine for abdominal pain as they mask the symptoms until it is too late

9 Decompressions should be performed only as a last resort i e when the tumor cannot be removed and then should be done only after the location of the tumor is known In half of the cases of brain tumor no good can possibly be derived from a decompression

10 Exploratory craniotomy for brain tumor is scarcely ever indicated The tumor should be accurately localized before operation is attempted

11 Scientific accuracy must supplant guesswork in the diagnosis and treatment. The treatment can be only the direct prompt and efficient eradication of the cause FREDERICK CHRISTOPHER, M D

Magnus, V : The Clinical Aspects and Results of Brain Surgery (Beitrage zur Klinik der Hirnchirurgie und Resultate) *Verh Mag f Lagenkunde* 1921 lxxxii, 3

This article is based on cases in the author's private practice From 1903 to 1920 there were 105 operations for cerebral tumor in 112 cases Sixteen of the patients died a mortality of 8 1 per cent twelve patients were cured and forty-eight were relieved of severe pain and retained their power of vision for the rest of their lives from one half to five years.

Of twenty patients operated on for epilepsy one died two were cured and two were benefited The condition of the rest remained unaltered Two cases of secondary traumatic subdural hæmorrhage and two cases of traumatic meningitis serosa were cured One case of traumatic hemiplegia and two cases in which a palliative trephination for cephalalgia was done remained entirely unaltered One case of cephalalgia associated with scaphocephalus and one case of cephalalgia associated with achondroplasia were cured In thirty-one cases of trigeminal neuralgia treated by extraction of the pontine root or resection of the gasserian ganglion there were thirty cures and no deaths Magnus gives the histories of the 112 cases of cerebral tumor He draws the following conclusions

1 Palliative trephination should be done as soon as a diagnosis of brain tumor and choked disk is made and there are no definite focal signs or symptoms of metastasis. The earlier trephination is performed the better the chances of preserving sight The dura mater should always be opened to the greatest possible extent

2 In typical cases of Jacksonian epilepsy an exploratory craniectomy should be undertaken even in the absence of choked disk.

3 Operation should be performed as soon as possible when epileptic convulsions increase in frequency when paralysis is progressive, when the patient complains of dimness of vision, and when on the whole there are signs of increased brain pressure

4 In cases of deep tumors only craniectomy with the formation of a large trephination opening removal of the bone and wide opening of the dura should be undertaken.

5 When the dura is found to be tense the lateral ventricle should be punctured before the dura is opened.

tive. If these no longer give relief the pontine root of the gasserian ganglion should be removed

KORTENHAY (Z)

Moure, P. Facial Autoplasty by Means of Scalp Flaps with Long Pedicles from the Temporal Region (Les autoplasties faciales par lambeaux de cuir chevelu à longs pédicules temporaux). *Presse méd.* Paris, 1921, xxix, 109.

The use of the scalp to repair losses of substance in the face is of relatively recent date. The author has made several facial restorations by this method and has obtained excellent results.

The scalp furnishes richly vascularized flaps and, in addition, hairy grafts with which the moustache and beard can be replaced. The method described is applicable to lesions of such extent that the use of tissue from the immediate vicinity is impossible. It can be employed to restore the upper and lower lips, the chin and the cheek, and especially the buccal commissure. The scalp graft may be cut so as to leave a temporal pedicle containing the temporal artery; this arterial irrigation assures remarkable vitality. The flap is cut long from one temple to the other, swung around on its pedicle, and brought down to the spot where it is to be applied. Following its fixation to the freshened edges of the defect it rapidly forms vascular connections. It is not separated from its pedicle for from fifteen to twenty days. During this period the cranial surface from which it was removed must be kept covered with compresses soaked with sterile oil. There is not centimeter of loss because any part of the strip not used to replace the loss of substance may be replaced on the cranium. The scars resulting from suture are rapidly hidden by the growth of hair.

Several cases operated upon in this manner are described and illustrated. In the first case a very large cheek defect was successfully covered and fifteen months later the graft had acquired perfect suppleness. In the second case the graft was used to replace the moustache. When the scalp strip is first sectioned from the pedicle any hair on it usually falls out but grows again later on. Some revising operations may be necessary.

The author is satisfied that the use of long pedicled scalp graft is of great value for the repair of facial defects. In the cases of women the temporal pedicle may be replaced by an occipital pedicle and the graft taken from the shoulder region.

W. I. Haworth.

Gibson, A. Facial Paralysis. *Surg. Gynec. & Obst.* 1921, xxxiii, 4.

Facial paralysis is a serious disability because of its psychic and physical complications. Its prognosis, and treatment depend upon its cause and site. A study of the sensory characteristics of the facial nerve has been made by Hunt.

Paralysis results from interference at any point between the lowest motor cortex of the facial area and the ultimate distribution. A lesion at any point between the point of exit from the [illegible] of the sixth nerve or between the pons and the Fallopian aqueduct [illegible] involvement of the eighth nerve or hyperacusis due to paralysis of fibers to the stapedius reflex. A lesion in the aqueduct causes disturbance of the chorda tympani. Following separation of the cord (tympani there is complete motor paralysis (Bell's palsy) without disturbance of taste or hyperacusis.

Causes of supranuclear paralysis are brain tumor, abscess and cerebral hemorrhage. Nuclear paralysis suggests syphilis. Diphtheria and poliomyelitis may be associated with paralysis. Infranuclear paralysis may have its origin in a tumor or hemorrhage in the pons, or a tumor of the cerebellopontine angle but the three most common causes are simple neuritis from exposure to cold, acute or chronic otitis media and trauma (especially that of the mastoid operation). Bilateral paralysis is not common and of uncertain origin.

Cases of simple neuritis due to exposure or Bell's palsy and cases of localized oedema from a reactive process following operation usually clear up. When numerous branches arise near the point of damage the outlook is not so favorable. Upper neuron cases and sudden complete paralysis following a mastoid operation which do not clear up in six weeks are not apt to recover spontaneously. The presence of a faradic response is always a hopeful sign. After complete nerve severance the reaction of degeneration appears in two weeks. Quantitative measurement of electrical response is of more prognostic value than qualitative response.

When facial paralysis is secondary to brain tumor, cerebral hemorrhage or hemiplegia, attention to the primary condition is essential. Cases of Bell's palsy or of spontaneous recovery are treated only by facial [illegible] massage and galvanism (although of doubtful value). Permanent[illegible] demands surgical care. Op[illegible] tempt either to remedy [illegible] defective [illegible] muscula[illegible] transplantation [illegible] anastomosis [illegible]

[illegible] operations are advisable when nerve [illegible] has definitely failed or only one nerve [illegible] has been injured and are performed to elevate either the eyelid or the angle of the mouth. Plastic methods of Lexer, Stein Hann, and Brunch, Blomberg are mentioned. Muscles elevating the angle of the mouth are most important those elevating the lower eyelid next in importance and the group acting upon the forehead and eyebrow least important.

Nerve anastomosis affords more equal muscle innervation and produces a less visible scar. Careful end-to-end anastomosis usually gives at least some recovery of function. Lateral implantation rarely. The author reviews the literature on [illegible] accessory and facio-hypoglossal anastomosis and Spiller recognizes three stages of [illegible] regeneration of normal muscular [illegible] early and war [illegible] derived

ual muscles (3) complete recovery which is more probable in young persons

The author describes operative procedures for fasciohypoglossal anastomosis In order not to injure the fibers the finest non-cutting needles thread ed with fine silk—preferably a strand of the finest Chinese twist silk—are used to stitch the sheaths of the nerves together Even the finest catgut lacks sufficient flexibility and is apt to bruise the nerve The experimental work of Sargent and Greenfield shows that fine silk is less irritating than plain cat gut No special bed or covering is prepared for the anastomosis The author gives the records of eight cases.

Gibson states that muscle tonus and voluntary movement will probably return. Emotional movement of the face is usually absent It is necessary to educate the tongue cortex to perform the complex duties of the facial cortex. After middle life the formation of new paths with new duties is imperfectly accomplished Under intelligent self-education of the facial muscles emotional movement may be regained For this purpose the hypoglossal is preferable because in emotional expression speech is used rather than the sternomastoid and trapezius muscles, tongue movements are finer than shoulder movements and the proximity of the speech center to the facial cortex may favor association paths. The absence of the sensation of taste is usually unnoticed by the patient. The loss of the motor function of half of the tongue in mastication swallowing, and speech leads to no material inconvenience and becomes less noticeable. The appearance of the tongue is of no importance. On the other hand loss of power in the sternomastoid and trapezius muscles produces deformity and discomfort

WALTER C BURKET M D

Van Allen C. M: Transorbital Puncture of the Gasserian Ganglion (*Ann. Surg.*, 1921 lxxiv 535)

The contest for supremacy between chemical neurectomy and operative neurectomy has been fought for thirty five years. Although operative neurectomy is undoubtedly the method of choice at present, a conservative view must concede the possibility that further observations and improvements in the technique may reverse this decision.

Any effort to improve and simplify the technique of the injection of the trigeminus will be valued not only for the help it may afford in the treatment of trigeminal neuralgia, but also because of its obvious usefulness in nerve block anæsthesia for the difficult technical operations within the zone of distribution of the fifth nerve. The latter is probably its most fruitful field of usefulness.

A large amount of work has been done in an effort to overcome the uncertainties and eliminate the dangers of ganglion puncture by way of the foramen ovale. Any method of approaching the ganglion through the foramen ovale is lacking in two important respects—there is no natural, easily followed pathway leading to the foramen and no limiting boundary to indicate the proper depth of penetration

This article presents a hitherto untried avenue of needle approach to the gasserian ganglion which will satisfy these two primary requirements and at the same time remain within the boundaries of reasonable safety The approach is the orbit the path followed is the medial orbital wall, and the portal of entrance to the cranial cavity is the sphenoidal fissure The needle is guided by the sense of touch along a smooth bony surface until its progress is obstructed by the bony fossa lodging the gasserian ganglion. The needle is separated from the delicate structures of the orbit by the medial rectus muscle and in the sphenoidal fissure it occupies the lower compartment which contains no nerves or vessels.

Special emphasis is placed upon the fact that Meckel's cave can hold only a few drops of fluid and any excess flows freely backward along the nerve trunk into the subarachnoid cistern at the base of the brain This occurrence is inevitable when techniques of Harris and Haertel in which there were undoubted symptoms of irritation of the structures in the basilar cistern principally the third fourth sixth seventh and eighth cranial nerves This danger offers the one serious objection to alcoholization of the gasserian ganglion.

On the basis of punctures on cadavers, the author concluded that from an anatomical standpoint, the technique described showed an efficiency of about 90 per cent.

In four out of five clinical cases in which it was tried the method was successful in producing anæsthesia of the entire trigeminal field Whether successful or not, the passage of the needle in these instances inflicted no serious damage The orbital portion of the route was entirely painless, but the passage behind the orbit was intensely painful

The striking of cerebrospinal fluid at the end of the passage indicates that the cave of Meckel is reached and that injection of the solution will involve the ganglion root. The striking of blood indicates clearly that the needle has stopped within the cavernous sinus and that all further attempts to reach the ganglion should be abandoned If the puncture is dry the needle has entered the lower part of the ganglion below Meckel's cave, and an injection of solution will flow upward into the cave and thereby infiltrate the nerve root, or the needle missed its mark and has come to lodge in some non vascular tissue.

It is evident that any injury inflicted upon the root of the ganglion by the injection of alcohol will

unable to recommend the puncture for the treat ment of trigeminal neuralgia. In the meantime however the results of this work, both anatomical and clinical have led him to believe that trans-orbital puncture of the gasserian ganglion fur ecuring block tory supplied ustified when

FREDERICK CHRISTOPHER, M D

Monnier E.: Operations for Cleft Palate (Ueber *Gaumenspalten-Operationen*) *Schweiz med Wchnschr* 1921 li, 970

The author reports the results in ninety cases of cleft palate operated upon by himself The treat ment has a double task (1) the correction of the malformation and (2) the realization of the best possible function Function will be poor if the oper

turbances of nutrition, diseases of the respiratory tract, and lowered resistance Therefore early oper ation is urgent

In infancy the bones of the face are still easily molded. Later they become more unyielding be*cause of greater calcification Many surgeons, how*ever see a contra-indication in the fact that as a rule infants withstand operation poorly Others are restrained also by the technical difficulties and the *belief that the delicate tissues dealt with do not have* the necessary resistance Such considerations are only partially justified When the infant is given proper care its tolerance is surprisingly great and if the surgeon has had sufficient experience, the technique of the operation is not very difficult Good preparation of the patient and the prevention of the aspiration of blood are absolutely essential

In the author s opinion the best time for operation is the end of the first or the middle of the second year If harelip and malformation of the jaw are associated conditions their correction must be undertaken very early as the pressure of the sutured borders of the lips has a formative influence upon the superior maxilla Unfortunately it is not possible to achieve the continuity of the split parts very early by means of a prosthesis as the teeth are still absent

According to Drachter three stages of cleft palate are distinguished *The first stage begins at birth* and ends at the closure of the harelip During this period the edges of the cleft are parallel and the

separation always increases and the uvular flaps diverge. The most favorable time for operative closure is the second stage, which lasts approximate-

ly from the first to the third year of life At any rate the closure should be done before the time of physiological speech

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flaps are separated as usual From five to eight days later they are freshened and united by suture. After

done most carefully It is advantageous to extend the incision widely into the mucosa of the cheek so *that the posterior palate portions can be well dis*placed Prolapse of the corpus adiposum make caused thereby is of no consequence. The pedicle of the anterior flap must be formed very carefully

done much more exactly when the flaps are freely movable.

The best suture union is the exact knot suture with the finest silk strengthened by two or three protective sutures of thicker silk. The author uses the long-shanked needle holder of Helbing exclusive-

the operation. He does not believe that this will cause the formation of lateral fistulæ. The rolling in of the flap edges must be carefully avoided

All the operations were done under light chloroform anesthesia induced by means of a catheter inserted in the nares, the head hanging down

Monnier s cases included fifteen complete clefts with protrusion of the intermaxillary bone, thirty complete clefts with clefts of the alveolar process, thirty-four subtotal clefts, and eleven clefts of the soft palate only A harelip operation had been done

previously in sixty five cases. Twenty two cases were operated upon during the first or second years of life. In the ninety cases there were only three deaths one due to pneumonia and another to thrombosis of the transverse sinus resulting from a latent purulent otitis which no doubt, was aggravated by the operation The third was that of a child with numerous malformations and an enormous cardiac dilatation

Complete separation of the sutures after the operation occurred eight times. Attempts at secondary suture were always unsuccessful. In three cases the failure was due to scarlet fever or diphtheria. Apparently children with wounds of the oral cavity are particularly susceptible to such infections. Therefore the operation should be delayed if there is the slightest possibility of such an infection. In two cases the failure was attributed to the novocaine adrenalin anesthesia which led to necrosis of the lip edges. In one case a chromic catgut suture was used and the result was poor because the catgut was absorbed much too soon. Subsequent operations may improve the results but the function of the soft palate remains poor because of the greater tension.

There were fourteen partial failures but in three-fourths of these cases a complete closure was obtained by subsequent correction though function frequently remained diminished. Defects lying in the center can be brought to closure secondarily by dabbing with tincture of cantharides. Secondary operations are best done three months after the first operation. Relaxation incisions should be made on both sides. For secondary closure of anterior fistulæ the anterior bridge must be divided transversely 5 mm. behind the alveolar process and the flaps approximated by lateral relaxation incisions The rarer lateral fistulæ are more difficult to over

cases. The total number of anatomical unions including those which were secondary, was sixty five The best results were obtained when the operation was performed on patients between 1 and 3 years of age

In conclusion the author again emphasizes the fact that the number of failures can be diminished by the two-stage operation, but they cannot be avoided entirely even by perfect technique In very rare cases the true velum retracts to a thin lamella

ultimate functional result must always be kept in mind the author is opposed to all the numerous complicated plastic methods of closure Under all circumstances, a long and movable velum capable of closing the nasopharyngeal space must be obtained.

In the after treatment instruction in speech is essential. When a plastic operation has not been successful good results in regard to speech can be obtained by the insertion of a well-fitting obturator

SCHUBERT (Z)

NECK

Frank, L. W : Observations on the Diagnosis and Treatment of Toxic Goiter *Internat J Surg* 1921 xxxiv 426

In the author's opinion thyroid disease should be suspected in a patient with tachycardia nervousness or muscular weakness He cites a case with these symptoms in which hyperthyroidism was not suspected at first The basal metabolism was 28 per cent above normal The adrenalin test was positive. Right lobectomy and partial left lobectomy resulted in improvement and a drop in the pulse rate to 80 per minute within twenty days.

Only a small percentage of toxic goiters have eye signs, such as exophthalmos or the Stellwag Dalrymple or von Graefe signs. Some of the most toxic goiters are small and hard. An X ray examination for substernal thyroid or thymic enlargement is important The author agrees with Blank of Leipzig that there are no blood changes such as a lymphocytosis which are characteristic of toxic or simple goiter

In all of Frank's cases diagnosed clinically as toxic goiter the basal metabolism was definitely increased In one case of colloid goiter the metabolic rate was 55 per cent above normal. Increased metabolism is suggestive in a suspected thyroid case but the diagnosis should be based on the clinical symptoms and findings.

The amount of increase in the basal metabolism gives an idea of the severity of the intoxication but does not indicate the operability of the case. Some patients with a good myocardium can be treated by operation successfully whereas others with only a slightly increased metabolic rate but with diseased heart muscle cannot undergo operation safely Clinical symptoms and surgical experience are the best guides to the method of treatment To illustrate this point the author cites a case with a basal metabolism 35 per cent above normal, a moderate reaction to adrenalin, and nodular enlargement of the thyroid but a poor myocardium which contraindicated operation Under treatment by rest and suitable cardiac stimulants the patient improved sufficiently to perform ordinary duties.

The adrenalin (so-called Goetsch) test was positive in all except two of the author's cases which were

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Frank

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opinion that the treatment is essentially surgical Thyroidectomy is the method of choice. When the X ray is used the patient improves during treatment but recrudescence soon occurs when the radiation is discontinued. WALTER C. BURRAT M D

Bérard L. and Dunet, C.: Is There Such a Condition as Metastatic Goiter? (Le goitre métastatique existe-t-il?) *Rev. d. chir. Par.* 1921, xl, 521.

In contradiction to all knowledge concerning the pathology of tumors, many surgeons and a number of anatomo-pathologists have described and continue to describe as "benign metastatic goiter" a condition which under the form of a benign neoplasm forms metastases in the same manner as an essentially malignant neoplasm. This idea of

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because the great majority of goiters reported as benign had not been examined microscopically at all or had not been subjected to a thorough examination with the microscope. When microscopic study is carried out with the necessary care it often shows that a thyroid which appeared clinically normal is histologically neoplastic and this fact is a definite argument against the theory of benign metastatic goiter.

The authors illustrate these points by a number of the cases which have been reported in the literature. In 1914, Crone reported six cases of thyroid metas-

fore conclude that there is no such condition as metastatic goiter; that the so-called "benign metastatic goiter" is in reality a malignant goiter; that the thyroid gland is no exception to the general laws governing the evolution of tumors; and that only malignant thyroid neoplasms form metastases.

In cases of tumors which show thyroid tissue under microscopic examination it is necessary to

growth is benign. Only a histologic examination of sections in series including the entire growth can settle the question. The microscope sometimes makes evident microscopic points of neoplastic degeneration which will be found only if they are sought systematically.

W. A. Bardeen.

Speese, J. and Brown, H. P., Jr.: The Malignant Degeneration of Benign Tumors of the Thyroid Gland. *J. A. M. S.* 1921, lxxvi, 684.

In 426 lesions of the thyroid gland cancer was found nineteen times and sarcoma three times. There were five cases in which a history of goiter preceding the development of cancer could not be elicited.

its hardness.

Cancer in a non-goitrous thyroid is very rare. A small movable tumor is usually the earliest finding.

thyroid and surrounding parts and causing the characteristic symptoms of malignancy. Acute enlargement in young people, at a time when physiological activity of the gland subjects it to sudden changes, is not so serious as in the old. Enlargements in those over 30 or 40 years of age should be regarded with suspicion.

When cancer develops in a thyroid affected with goiter a subacute course usually is followed. The period between the primary enlargement of the goiter and the extracapsular extension of the cancer, the period when operation should be performed because metastasis or infiltration has not occurred, is difficult to determine. According to Carrel-Billard the development of cancer alters the thyroid secretion so that an increase or decrease of thyroid function may appear under variable conditions.

The reaction of the organism to the toxemia of thyroid cancer is classed under three heads: (1) hyperemia, in which a rising temperature up to 39 degrees C. may precede the appearance of the tumor; (2) symptoms of Basedow's disease; and (3) disturbance in nutrition manifested at first by loss in weight.

The authors conclude that benign tumors of the thyroid gland preceded the development of malignancy in practically all cases.

Cancer is found most frequently associated with colloid and foetal adenomata, and is relatively uncommon in simple goiters.

To prevent leaving behind a small adenomatous nodule from which malignancy may develop at a later day it is necessary to make a thorough exploration of both lobes of the thyroid.

When cancer is present clinically and the diagnosis can be made easily operative measures offer but little hope. The majority of cases are discov-

Enlargement of a pre-existing goiter and an increase in its hardness are the first signs of carcinomatous degeneration of a benign struma.

I. W. Bach, M. D.

Van Hook W : A Simple and Relatively Safe Thyroidectomy *Med. Rec.*, 1921 c, 1072

One of the most serious difficulties associated with the treatment of goiter lies in the determination of the amount of tissue to be removed The old procedure of removing one lobe is inadequate but the dictum that one fifth of the thyroid mass should be left is equally unsatisfactory

Recently the author has left small masses at each of the horns of the organ and in addition, a thin layer of thyroid tissue attached to the posterior untouched part of the gland capsule. These are left by choice because their volume can be rather accurately gauged and because they are well provided with blood vessels and lymphatics which allow for hypertrophy if this is demanded by the organism

Kocher s collar incision is made a finger breadth above the sternum and at a level which will give the best access to the horns of the gland. The platysma is divided and the sternothyroid and sternohyoid are retracted or transversely sectioned. The half of the gland chosen as the first to be attacked is lifted out between the thumb and first finger firm and fairly deep retraction is made and the cornu is isolated and divided between clamps The lower lobe is divided between forceps in the gland substance and the main mass of the gland is shaved from the posterior capsule The capsule is then closed the muscles are sutured and the skin is closed around a drainage tube The drain is removed at the end of twenty four hours

H \ McKnight M D

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Keyser L. D : Massive Hypertrophy of the Breast. *Surg Gynec & Obst* 1921 xxxiii 607

The author reviews clinical and experimental data on factors affecting mammary development and function. The breasts develop from a modified group of sudoriparous glands and their development and function are under the control of endocrine forces. Puberty hypertrophy is dependent on ovarian activity A definite cycle of mammary activity runs somewhat parallel to the menses. There is suggestive evidence that the formation persistence or regression of the corpus luteum may influence the activity of the breast in the pregnant as well as the non pregnant state There is no good evidence to prove that the uterus, decidua fœtus, or placenta are *directly related to mammary function*

Massive hypertrophy of the breast is a deviation from normal development The process does not suggest a neoplasm as it is diffuse and seems to affect all portions of the organ uniformly and simultaneously The age of onset in one half of the bilateral cases is under 18 years. The process is associated most frequently with puberty and next most frequently with pregnancy The cases of patients as old as 48 years have been reported although with an increase in age there is a marked drop in the incidence of the condition. As a rule the process is bilateral When it is unilateral both sides of the breast are about equally affected.

The secretory activity of hypertrophied breasts is variable Usually it is normal but may be either absent or excessive. The rate of growth may progress uniformly or intermittently Pain is not frequent

The relationship of hypertrophy of the breasts to

[illegible]

cases In some cases spontaneous regression occurs

The author suggests that terms such as diffuse virginal hypertrophy and gravidity hypertrophy are inexact

[illegible] in the literature Malignancy is rare but has been recorded

Pathologically most cases are fibro-epithelial (frequently associated with fibro-adenomata) or adipose Two cases of each type from the Mayo Clinic series are reported in detail The patients with fibro-epithelial hypertrophy were a girl of 15 years and a woman of 36 In the woman the hypertrophy began with pregnancy The adipose hypertrophies occurred in a virgin of 19 years and a parous woman of 41 years, but in the latter case *was not associated with pregnancy* The adipose type is rare only four cases have been recorded previously

The fibro-epithelial hypertrophies were associated with fibro-adenomata, succulence of the prepon derant fatty tissue, rapid proliferative changes in the fibro-adenomata, and reproductive activity in

absence of acini and a preponderance of fat. A few fibrous bands traversing the fat carried a moderate number of acini showing primary cytoplasia The epithelium in both types was hypertrophied to a variable degree.

The etiological factors are not clearly understood but the evidence suggests an endocrine dyscrasia probably of the ovarian type.

To be differentiated in the diagnosis are intracanalicular myxoma and fibroma, sarcoma, elephantiasis and the fatty breasts of obesity.

If spontaneous regression fails to occur after a reasonable length of time surgical amputation may be indicated

MISCELLANEOUS

Watts, S. H.: Traumatic Chylothorax. *Ann. Surg.* 1921, lxxiv, 691.

Watts presents a case of traumatic chylothorax. Milky effusions in the serous cavities are quite uncommon. They occur most frequently in the peritoneum, are less frequent in the pleura, and are very rare in the pericardium. Milky pleural effusions are of two varieties: (1) the true chylous, due to the escape of chyle into the pleural cavity through a thoracic duct lesion, and (2) the chyloid, due to simple or tuberculous pleuritic effusion, abscess of the lung, carcinoma of the pleura, lymph vessels and lymph glands, extreme cardiovascular changes and

does not coagulate on standing, contains fine fat globules which may be readily stained with osmic acid or Sudan III, and clears when alkalinized and shaken with ether. The specific gravity generally exceeds 1.012. The fat content is usually high, varying from ½ to 4 per cent. In most cases there is a definite sugar reaction. Lecithin is found only in traces.

The chyloid effusion accumulates less rapidly, is less milky, contains much less fat, sometimes only a trace, and is not so completely cleared by shaking with ether. The cellular elements may be numerous and frequently they contain fat. The specific gravity is usually less than 1.012. It contains serum al-

the right pleura is in close approximation to the duct, forces which affect the duct are apt to injure both

structures. Some authors, notably Hammerschlag, believes that this is the only explanation of the presence of chyle in the pleural cavity in the case reported

and many are associated with fracture of the ribs or vertebræ. In some instances, however, there is no evidence of bony injury, and the rupture of the duct is due probably to alterations in the intrathoracic pressure or to overstretching of the duct, its state of fullness possibly being of some importance in the etiology.

scopic and chemical examination will give definite findings. In non-traumatic cases there are seldom any subjective symptoms except dyspnœa and weakness.

as the relief of pressure may increase the leakage from the duct. Thoracotomy is not to be recommended. Hall and Morgan claim that all the injured duct needs for recovery is rest, and that this may be secured by feeding through the rectum exclusively, the food thus given being absorbed by the colonic lymphatics which pour their contents into the general superficial and peripheral lymph channels instead of the lacteal system. The author does not believe that experience will bear this out.

I. W. Bach, M. D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Gordon, M. B., and Golan, D. L.: Traumatic Diaphragmatic Hernia in a Girl 8 Years of Age. *Am. J. Dis. Child.* 1921, xxii, 579.

been exposed to view as the small and large intestines, the stomach, and the left lobe of the liver had entered the chest through a large rent in the diaphragm.

The author's conclusions are summarized briefly as follows:

1. In every case of either true or false dextrocardia a roentgen ray examination of the gastrointestinal tract should be made with barium.
2. Every patient with dextrocardia should be examined completely in both the erect and the supine positions.
3. A careful history should be obtained in every case of dextrocardia, especial emphasis being placed on injury of the abdomen.
4. The possibility of traumatic diaphragmatic hernia should be considered in cases of severe abdominal injury when there is an increase of intra-abdominal pressure.
5. Because of the possibilities of strangulation, immediate operation is indicated in every case of traumatic diaphragmatic hernia.

Frederick Christopher, M. D.

Forster E. Genuine Cysts of the Mesentery (Ueber genuine Cysten des Mesenteriums) *Beitr z. klin Chir* 1921 cxxiv 116

Of the three types of mesenteric cysts, true cysts, foreign body cysts, and cystoids (traumatic softening and liquefaction cysts) this article takes into consideration only true cysts. To these belong first of all the lymphangiomata (cavernous and cystic) originating in abnormal dilatation of the lymphatic vessels and generally of congenital origin On account of anastomosis with the chyle ducts or because of cell degeneration their contents are usually chylous and when there has been hæmorrhage they are sanguinous. From their contents, therefore it is impossible to draw a conclusion regarding their origin.

In a case reported by the author a cyst of the transverse mesocolon was found which contained 10 liters of a brownish yellow clear fluid Following resection of the mesocolon the patient died of peritonitis.

Forster has found in the literature twenty five cases of cysts originating in the omphalomesenteric duct These are formed by encapsulation of a Meckel dive
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Their contents are mucinous.

Cysts originating from the wolffian duct are characterized by the presence of ovarian kidney or adrenal tissue. Simple dermoids are rare. Usually these are small solid retroperitoneal tumors but they may also migrate into the mesentery of the small bowel. The complex dermoid cysts are still more rare Some of them probably have their origin from completely separated ovarian cysts but others arise from the testicle. They contain derivatives of all the germinal layers besides the ectodermal products there are also rudimentary parts of the nervous system brain cartilage, bone gastro-intestinal tissue and vascular system. Finally there are the fœtal inclusions in which amniotic membranes may be seen and the teratoid mixed tumors originating either in displacement of primary layers or of a bi-germinal nature As the former they contain tissue from all three germinal layers but show no typical structure. They are found more often in females

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hydronephroses and Grawitz tumors by the kidney shape of one of their poles as well as by the cysto-

early adhesion to the abdominal wall. Walled-off peritoneal inflammations become flattened during anæsthesia.

Simple dermoids and enterocystomata are found most commonly in the mesentery of the small intestine, but all of the others may also develop here. Fœtal inclusions are found usually in the transverse mesocolon, and complex dermoids in the ascending colon. Mesenteric cysts may lead to ileus through torsion or invagination If at all possible these cysts should be radically extirpated. If this is impossible because of extensive adhesions or the patient's poor general condition, they should be sutured to the abdominal wall and drained by the formation of a fistula SILVERS (Z)

Pitzman M A Fundamentally New Technique for Inguinal Herniotomy *Ann Surg* 1921 lxxiv 610

The author's operation consists essentially in the suturing of the transversus fascia and aponeurosis (and only these layers) down to the inguinal ligament of Poupart before the peritoneal cavity has been closed Pitzman believes that this technique is applicable to all inguinal hernias small or large primary or recurrent, and especially to medium and large necked hernias The underlying principle is the reproduction of physiological valve action by (1) resection of the hernial sac, (2) repair of the
rsus (transversalis)
ary to the internal

FREDERICK CHRISTOPHER, M.D

GASTRO-INTESTINAL TRACT

digest 1921 lv 662.

In an active ulceration there is always inflammation of the peripheral mucosa with abundant secretion of mucus which engulfs any hæmatin present and renders it insoluble in water or a weak acid solution such as is found in the stomach and the first portion of the duodenum Therefore a laboratory test for blood (hæmatin) made on the gastric or duodenal contents may be negative. On the other hand both mucus and hæmatin are easily soluble in a weak alkaline medium Before analyzing the gastric contents, therefore, Meunier injects into the stomach 200 c cm. of water or physiologic salt solution containing 10 drops of ammonia In addition he gives three spoonfuls of pulverized carbon and examines the fæces for occult blood after

He suggests increasing the amount of the fluid for the gastric lavage from 00 to 500 c cm. the use of carbon in the form of pastilles and the administra

ferentiated easily The author has found this method of seeking occult blood very much more satisfactory than others in general use

W A. BRENNAN

Ober

dary finding in an autopsy on the body of a man 19 years of age This growth which was a flat tumor as thick as the hand and as large as the palm in the stomach could

of the stomach COLLEY (Z)

Rowlands, R P A Case of Partial Pyloric Stenosis (Hypertrophic); Finney s Operation *Lancet* 921 ccl, 1373

The case reported was a typical instance of partial stenosis due to spasm and hypertrophy of the pyloric sphincter The pyloric channel was partially obstructed by the usual infolding and thickening of the submucous tissue but there was no sign of active or healed ulceration

The author believes the clinical history is characteristic The patient was well while at rest under observation at the hospital, and the attacks came on

because the fibrous changes in the pylorus of the adult—especially when the condition is advanced—require a more radical operation For such cases Rowlands prefers the Finney operation

E C ROSTHERN, M D

Cheever D The Pathological and Physiological Basis for the Surgical Treatment of Chronic Gastric Ulcer *Boston M & S J* 921 clxxxv 707

The greater frequency of ulcer along the lesser curvature of the stomach and in the duodenum may possibly be explained by the peculiar arrangement of the arteries in these regions favoring vaso a n

digestion of the injured tissue is indicated by the fact that ulcers occur only in the stomach, the portion of the duodenum proximal to the opening of the bile and pancreatic ducts, and in the jejunum at or just beyond the stoma of the gastro-enterostomy regions where the acid pepsin is active

Some authorities maintain, however that this assumption is not warranted by experimental laboratory or clinical facts as unhealed ulcers have been found in stomachs free from acid pepsin and

into the stomach of the experimental animal without producing ulcer Moreover in cases of unhealed ulcer acid of five times normal strength will not cause symptoms in the quiescent stage An acid medium is normal for the gastric mucosa Such being the case, prolonged alkalinization may lead to a compensatory over acidity of the acid cells and the *ultimate degeneration of the mucosa*

In Cheever's opinion the factors entering into the formation of gastric ulcer are similar to those causing chronic ulcers elsewhere The chronic indurated varicose ulcer of the lower leg fails to heal first on account of infection and irritation resulting from lack of rest and circulatory impairment due to the varicosity of the vein If these conditions are not corrected the vascular granulation tissue

and initiates an excessive reflex inhibition of the relaxation of the pyloric sphincter so that relief of the intragastric pressure is not afforded and increased

by forming a permanent artificial anastomosis Excision of an ulcer at the pylorus almost anywhere on the lesser curvature except the highest part, and surface of the nd transgastric f the posterior usually be carried out unless there are unusual complications

In cases of duodenal ulcer the question of excision is modified by three considerations (1) the technical difficulty of excision on anatomical grounds (2) the possibility of effectively excluding the ulcer

by proximal closure of the viscus and (3) the great rarity of carcinoma in this situation. While many favorably situated duodenal ulcers may be excised, their removal need not be insisted upon as the complete rest and freedom from hydrochloric acid digestion afforded by exclusion make it unnecessary

The surgical correction of pathologically altered gastroduodenal physiology is obtained by two similar methods, each of which has its advocates (1) gastrojejunostomy with some form of pyloroplasty and (2) gastroduodenostomy These expedients secure more prompt emptying of the stomach neutralize the acid gastric juice to some extent by its admixture with the duodenojejunal contents, cause relaxation of pylorospasm and prevent hypersecretion by preventing retention

C Corbin Yancey M D

Klein E.: The Persistence of Gastric Ulcer After Gastro-Enterostomy *Ann Surg* 1921 lxxiv 740

Although during recent years there has been an increasing tendency to treat gastric ulcer by more radical procedures than gastro-enterostomy Sherren has stated that in the majority of cases gastro-enterostomy is still the operation of choice and this procedure is favored by Paterson Coffey Metraux, Zacherl Landes, Borchgrevink, Kuttner Rowlands, Gallart and Ribas However the frequent occurrence of the following late sequelæ is

2 Perforation of an unhealed ulcer This has an ulcer The nings of malig nancy at operation seems to warrant the routine removal of all ulcers

4 Persistence or recurrence of gastric symptoms. These sequelæ incline the author to the view now steadily gaining ground that whatever procedure is used it should include the removal or destruction of the ulcer if this is at all possible

In conclusion Klein states that it is unfair to compare the mortality statistics of partial gastrectomy and gastro-enterostomy as the former operation can cure severe cases in which the latter is entirely without effect J D Ellis M D

Mol

i, 385

This report is based upon 124 cases of gastric and duodenal ulcer which were treated during the period from September 1910 to January 1921 by gastro-enterotomy There were eighty-six cases of gastric ulcer twenty-eight cases of duodenal ulcer and ten cases of gastroptosis and gastric dilatation.

Among the subjective symptoms in cases of ulcer the author considers those of dyspepsia and pain as the most important The obstipation, which always disappears after a successful operation is characteristic. Objectively increased tension of the upper parts of the rectus muscle, hyperacidity and blood in the gastric contents and fæces are demonstrated The diagnosis of peptic ulcer is usually easy, but the differential diagnosis between gastric ulcer and duodenal ulcer is very difficult This is due partly to the fact that both ulcers are present simultaneously that in the majority of cases they are multiple and that frequently at operation perigastritis is found with duodenal ulcer and periduodenitis is found with gastric ulcer

The material of the Surgical Clinic of the University of Moscow consists mainly of chronic ulcers many of which have bled profusely shortly before the operation In spite of this fact the ulcer was not always found at operation even when the stomach was opened The majority are cases of simple ulcer Callous and perforating ulcers are rare Usually there are characteristic changes of the serosa such as adhesions cicatrices, hyperæmia, and infiltration The adhesions are often very extensive. As a rule all these changes are localised at the pyloric and prepyloric portions but in some cases the inflammatory process involves the small intestine, which then appears adherent to the posterior gastric wall. Not rarely swollen soft lymphatic nodes are found in the small omentum In two cases the mesocolon was markedly œdematous and in two others there was slight ascites

changes.

The question of the etiology is still unanswered. According to the material reviewed, the condition is most frequently referred to some trauma, and apparently is dependent upon an irregular diet coarse food and psychic trauma In individual cases intoxication comes up for consideration as an etiological factor In almost all cases exacerba

tenderness is found in the ileocæcal region. Even if there is a relationship between these two conditions, as is claimed by Americans, no improvement was noted in the course of one of them after opera

years. The effect of heredity was very frequently

The author discusses the various theories regarding the value of gastro-enterostomy and the different methods which have been proposed as substitutes for this operation. In Molodaja's opinion even resection of the stomach does not offer absolute assurance against fatal hæmorrhages and perforations from ulcers overlooked during the operation. The frequent recurrences after resection and other findings indicate that gastric ulcer should be considered as a constitutional disease and the best treatment is that which removes the causative factor. The material presented does not indicate that gastro-enterostomy should be given up but the most frequent complication following this operation, cicatricial stenosis of the anastomosis, must be borne in mind as it is apt to discredit the procedure. It should be remembered also that

and does not remove it. Fatal hæmorrhages or perforations do not occur at the Moscow Clinic. The end-results could be determined in only 40 per cent of the cases operated upon as the other patients could not be found. Gastro-enterostomy is indicated in all cases of ulcers of the stomach and duodenum.

Posterior gastro-enterostomy is to be considered the method of choice. The prepyloric portion is selected for the anastomosis, and the connection with the small intestine is made directly at the duodenojejunal fold. The anterior gastro-enterostomy of Woelfler combined with the entero-anastomosis of Braun is used only when posterior gastro-enterostomy is impossible. Altogether there were 124 operations. In three cases the Woelfler Braun anterior gastro-enterostomy was done; in three cases, the posterior operation of Petersen with pyloric closure; in three the posterior operation of Hacker Braun; in one a gastroduodenostomy and in the remainder the posterior gastro-enterostomy of Petersen. Six patients died after the operation, five of them were very much weakened from severe hæmorrhages. Of the remaining 118 patients, ninety-one showed an immediate good result and the twenty seven others were benefited. The following complications were noted: loosening of the sutures in four cases; atony of the stomach in two; hæmatemesis in four; and contraction of the anastomosis. In one case the stenosis was caused by contraction of the suture of the mucosa. After removal of the suture the stenosis disappeared. In a second case there was cicatricial contraction in the mesocolon, and in a third case a peculiar tendency of the gastric wall to form plastic processes. In the Moscow Clinic stenosis has been successfully treated up to the present time by lengthening the incision.

The material described indicates that posterior gastro-enterostomy is the method of choice for ulcers of the stomach and duodenum. Resection should be done only on callous ulcers suspected of malignant degeneration. To obtain good permanent results, dietetic treatment should be given for two or three months after the operation.

VON HOLST (Z)

Gibson, A. G.: The Pathology of Gastric and Duodenal Ulcer. *Brit. M. J.* 1921, II, 933.

In experiments on monkeys to study the pathology of gastric and duodenal ulcer one of the animals was injected intraperitoneally with a broth culture of streptothrix actinomyces obtained from a case of acholuric jaundice. At necropsy thirty two weeks later this animal showed a chronically inflamed and fibrotic spleen with thrombophlebitis, multiple gastric ulcers, hæmorrhagic spots and occult blood throughout the lower intestinal tract and hæmorrhagic and embolic lesions of the liver and lungs.

As observed by W. J. Mayo about 30 per cent of the venous blood from the spleen may return by

operation, and bile could always be found in the gastric juice.

Permanent results were found in 37.5 per cent of the cases. In forty cases (71.4 per cent) the results were good, in ten (18 per cent) there was im-

four cases each of postoperative hernia and con-

ing in a diseased spleen.

In the clinical conditions known as acholuric jaundice and splenic anæmia, more especially the latter, we often find marked anæmia and hæmatemesis. Both diseases are undoubtedly due to an infective lesion in the spleen.

The author concludes that in a small proportion of cases of acholuric jaundice and splenic anæmia the gastric hæmorrhage may be due to septic or infective emboli originating in a diseased spleen and lodged in the gastric mucosa by way of the vasa brevia of the gastric wall. L. H. FOWLER, M. D.

Webb, R. C.: Disconnecting Gastro-Enterostomy Stomata; A Clinical and Experimental Study. *Surg. Gynec. & Obst.*, 1921, xxxiii, 681.

Webb states that a gastro-enterostomy should not be performed unless the definite indication or lesion is demonstrated at the time of operation. Persons subjected to gastro-enterostomy unnecessarily present symptoms of a vicious circle with continuous and frequent vomiting of bile-stained material and abdominal pain and distress. There seems to be no non-operative relief for this condition.

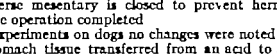
The disconnecting of gastrojejunal stomata should be preceded by most careful clinical and

laboratory studies. Numerous methods are used but there is as yet no standardized procedure The chief problems are (1) the restoration of the organs to their normal positions and mobility with as few adhesions as possible and (2) the prevention of constriction of the lumen of the jejunum

The Andrews operation with slight modifications should become a standardized procedure as long as the indiscriminate use of gastro-enterostomy without indication is continued This operation is as follows

After *lifting of the transverse colon* and exposure of the line of union to the bowel the rubber-covered clamps are placed on each viscus a free space for operation being left The incision is made upon the stomach wall 1 cm from the line of anastomosis so that a cuff of stomach is left entirely around the false opening in the bowel. When the jejunal opening is closed there is just enough tissue to bring the bowel to its normal diameter when two or three rows of inversion stitches have been placed The stomach opening is closed by the usual method the loss of tissue is of no consequence. The opening in the transverse mesentary is closed to prevent hernia and the operation completed

In experiments on dogs no changes were noted in the stomach tissue transferred from an acid to an alkaline medium and deprived of its original blood and nerve supply H A McKNIGHT M D



Durchtrennung vorzuziehen?) *Munchen med Wchnschr* 1921 lxvii 1413

The pylorus was excluded in twenty cases by strapping it around with the ligamentum teres. The latter can be freed sufficiently to wind it twice around the isolated pylorus which is 5 to 7 cm. wide and then to tie it The sling was immediately tightened to close the lumen. Infection and disturbance of nutrition of the gastric wall did not occur The knot was fixed with a silk suture and the sling covered over with Lembert sutures.

The author believes that with this procedure a secondary cutting through of the sling is prevented and permanent closure of the pylorus can be achieved. In cases controlled roentgenologically for two years the closure persisted. In two cases, however severe symptoms re appeared two months after the operation and the roentgenogram showed that the pylorus had again become patent. At a second laparotomy an extensive plastic inflammation was found in the region of the pylorus and its surroundings The gastro-enterostomy easily ad

the increased gastric peristalsis the true cause of the postoperative trouble is perhaps to be sought in the stretched peripyloric adhesions for which the aseptic tissue stimulation of the transplant was responsible

A pyloric resection (Billroth II) is advised, even when the ulcer is situated in the duodenum

WORTMANN (Z)

Caminiti Vinci G : Gastro-Enterostomy with Pyloric Exclusion by Pariavecchio's Method in *Gastro-Enteric Cancer* (La gastroenterostomia con esclusione del piloro alla Pariavecchio nel carcinoma gastro-enterico) *Policlin* Roma 1921 xxviii, sez prat 1683

The author believes that when gastrectomy is contra indicated in a case of gastropyloric cancer by the patient's condition or the stage of the disease with pyloric ist be simple -iselsberg Kocher Doyen Schiassi and others compli cate the main operation and increase its dangers, especially if the patient's general condition is poor Plastic methods prolong the operation too much Pariavecchio's ligature method is the best

The author used Pariavecchio's method in the treatment of five cases of gastropyloric cancer Three of these patients have been followed the others were surgically cured and their general condition was improved when they left the hospital. Since then it has been impossible to trace them Of the three traced, one died of the disease five and one-half years after the operation but was able to continue his work for four years One remained well for fourteen months In the third case, which was operated on four years ago the X ray shows that the food passes through the neostomy the pylorus being completely blocked

In the author's opinion his results compare very favorably with those of resection for the same condition but the method he used is advisable only when resection is impossible W A. BRENNAN

Babcock, W W : Factors Determining the Efficiency of Operations upon the Stomach *Illinois M J* 1921 xl, 444

There has been practically no change in the fundamentals of gastric operations in the past thirty years No basis has been determined for the treat

opening well toward the pylorus, and the maintenance of *the jejunum free, unkinked, non rotated,* and well outside the lesser peritoneal cavity The operation is perhaps a makeshift which is better for duodenal ulcers than gastric ulcers.

No definite guide has been determined for operating upon a gastric ulcer An operation is performed because the surgeon likes it or devised it,

and as a result there is a new field of gastric pathology due to the intervention

within the peritoneum Operations which fix the stomach may be harmful as are those which free the fixed and retroperitoneal duodenum and ascending colon The loose attachment of the gastric mucosa to the muscularis favors plastic operations Most of

to neutralize the acid of the stomach and place that *organ at rest during the intervals between the ingestion* of food Bile does not produce nausea and is

motility other things being equal, will increase the amount of free and combined acid in the stomach Ingested alkalies, meats, and meat extractives increase the acid flow

Gastric motility depends upon the intrinsic gan-

As the normal motion of the stomach is toward the pylorus, the food may pass through the pylorus even though a new opening is made The back flow of duodenal juices through the new opening may tend to neutralize the acidity coat the stomach with mucus, and favor the healing of an ulcer

The opening of the pylorus is stimulated by three factors besides the peristaltic waves the acid chyme on the gastric side, the neutralization of the acid

pylorus is destroyed the duodenal ring acts as a *sphincter and therefore the best results are obtained* by anastomosis of the stomach and duodenum above that muscle For this reason the Billroth I operation is better than the Billroth II operation or the Polya partial gastrectomy

The intestinal mucosa is protected from the acid

the acid stomach. Jejunal ulcers are common only after anastomosing operations. If the bile and pancreatic juices are diverted from the duodenum, ulcers are common. This has been shown in experiments on dogs by Exalto by the production of jejunal ulcers in six of seven dogs when the duodenal flow was diverted into the colon following gastrojejunostomy

Chyme causes acid reaction in litmus paper dipped in bile less rapidly and less completely than in

heal more efficiently than those of the fundus or

ever as only a few cases have been treated in this

heal quickly after alkalinization following gastro-*enterostomy pyloroplasty or cholecystogastrostomy* In a chronic ulcer the sclerosed walls may prevent healing and thus make excision or the use of the cautery necessary In some cases of chronic ulcer the author does a plastic operation on the mucosa, dissecting the ulcer layer by layer and covering it with healthy mucosa This may be easier than a pyloroplasty

The article is concluded with the following summary

In order that postoperative pathology may be avoided, physiological methods should be used in stomach operations.

We should individualize in gastric ulcer treatment Gastro-enterostomy is more logical when there is high acidity and increased motility but more apt to produce secondary ulcer It should always allow free access of duodenal fluid to the ulcer and when there is hyperacidity should be placed as near the ampulla of Vater as possible. In cases of chronic ulcer with sclerosis low acidity and the absence of obstruction, excision or cauterization is preferable. Fixation of the stomach and gastroplication are of little value. Division or destruction of both the pylorus and duodenal sphincter should be avoided. Anastomosis should be done above the duodenal sphincter to protect the intestine from distention The Billroth I method is preferable to other operations for resection

MARCUS H. HOBART M.D

Schoemaker J : Some Technical Points in Abdominal Surgery *Surg Gynec & Obst* 1921 xxxiii, 591

of the large intestine without opening the lumen of the colon the mucosa is neither seen nor touched. For spasm of the pyloric sphincter he does a hemisphincterectomy The pylorus is grasped between



Fig 1 Incision in resection of stomach

the thumb and forefinger and an incision is made in the serosa. The muscle is freed cut near the greater curvature pulled out with a forceps and again cut near the lesser curvature The serosa is closed with three or four stitches. For resection of the stomach he uses the Billroth I method employing an incision which permits the approximation of the stump to the duodenum without tension

FREDERICK CHRISTOPHER, M D

Furlah, G W T : A Surgical Curiosity *Canadian M Ass J* 1921 xi, 950

The case reported was that of a woman 33 years of age, who had been operated upon in September, 1919, for some uterine condition. Just what had been done was unknown

abdomen which was most marked over McBurney's point. The symptoms had been masked by morphine. The diagnosis rested between appendicitis and obstruction of the intestines.

At operation the appendix appeared normal but the small intestine was red, distended and oedematous. There were no adhesions A lump found in the small intestine was removed. On examination this proved to be a gauze sponge measuring 11 by 30 in

CARL R. STEINER, M.D

Smith F K.: The Diagnosis and Treatment of Perforated Duodenal Ulcer Founded on Forty One Consecutive Cases. *Brit M J.*, 1921 ii 1068.

The author reports a study of forty-one consecutive cases of duodenal ulcer The records show that

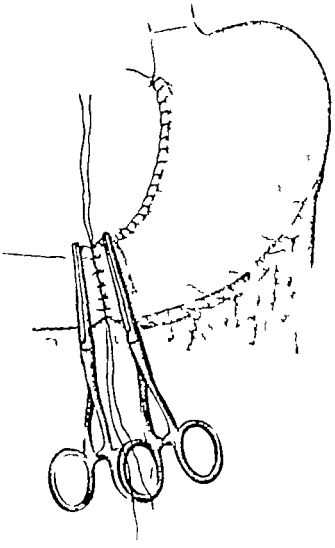


Fig 2 Union between stomach and duodenum completed (*Some Technical Points in Abdominal Surgery—Schoemaker*)

in women the occurrence of duodenal ulcer is rare and perforation is still more uncommon the ratio of men to women being 40 to 1 The youngest patient in the series was 17 the oldest 62 years. The previous history of ulcer and the period of exacerbation of symptoms previous to perforation varied from a few hours to a week.

Perforations are classified into three groups (1) profuse rapid and diffuse (2) profuse more gradual and more localized and (3) small gradual and localized. Most of the author's cases belonged to the first two

Smith describes the three classical stages (1) sudden acute pain in the epigastrium collapse, subnormal temperature rapid pulse (2) a later period with few symptoms and fewer signs and (3) acute peritonitis and rapid pulse with mounting temperature.

In making a differential diagnosis attention should be given to a history of indigestion, acute appendi-

closure of the perforation by a purse-string suture and irrigation of the peritoneal cavity with an outlet tube in the suprapubic wound until the fluid comes away clear After closure of the suprapubic wound the patient should be placed in the Fowler position

M R Trusal M D

Bachlechner K. Inflammatory Ileocecal Tumors (Ueber entzuendliche Ileocoecaltumoren) *Beitr z klin Chir* 93 1914 103

Bachlechner reports on four cases from the Braun clinic

Case 1 The illness had begun suddenly three months previously with abdominal pain Since then a tumor had slowly developed in the lower part of the abdomen on the right side The neoplasm was tender on pressure and somewhat uneven The diagnosis was tuberculosis or chronic appendicitis Operation revealed a cæcal tumor covered by omentum This was resected and a lateral ileocolostomy was done The patient recovered

The specimen showed that the serosa and muscularis were greatly thickened The mucosa was swollen but there was no ulceration The sections showed only inflammatory processes The condition of the appendix is not reported

Case 2 For several weeks the patient had had trouble in defæcation and gas in the right side of the abdomen which was expelled with difficulty In the lower part of the right side of the abdomen was a large tender mass extending from a finger s breadth below the spinal line to the border of the costal arch At operation a tumor the size of a child s head, which was firmly attached to the posterior wall of the cæcum, was removed and the bowel joined by lateral anastomosis The ileum showed considerable hypertrophy The operation resulted in a cure

The specimen showed much induration and fatty formation In the indurated cæcal wall lay the appendix from which fistula like pus-filled passages led into the thick fatty tissues of the surrounding part

Case 3 The patient was a man 71 years of age who for eight days had suffered with partial retention of gas and stools There had been no vomiting or fever A diagnosis of strangulated hernia on the right side was made An area of resistance the size of a fist and painful on pressure was found in the lower right abdomen near the inguinal canal The inguinal canal was scarcely penetrable with the tip of the finger and very tender A large hard tumor of the cæcum was found The tumor and the entire ascending colon were resected and the continuity of the bowel restored by side-to-side anastomosis The patient recovered

Pathologic examination showed induration of the connective tissue in the vicinity of the cæcum which was apparently due to perforation of the appendix.

Case 4 February 20 1920 the patient had an attack of acute appendicitis After six weeks of rest in bed and evacuation of pus through the rectum his condition improved, but two weeks later there was recurrence of the pain and vomiting May 12 1920 the cæcum, which had been transformed into an indurated tumor was removed and the bowel united by end-to side anastomosis A cure resulted

The literature contains the reports of thirty-seven similar cases The cause of all inflammatory tumors is continued irritation due to a bacterial focus or a foreign body (fæcal stones were not found in Bachlechner s cases) Tumors of the type described in the vicinity of the cæcum almost always develop insidiously and without characteristic symptoms because of their location in the insensitive abdominal region The differential diagnosis from malignant tumors, tuberculosis, and actinomycosis of the bowels may be very difficult Obstruction of the lymph particularly in the submucosa may favor the fibroplastic process Since it is usually impossible to determine the character of the tumor with certainty in the course of operation Bachlechner believes that ileocæcal resection is the only rational procedure

Marwedel (Z)

Davis, C B The Diagnosis and Treatment of Cancer of the Large Bowel. *Illinois M J* 1921 xl, 441

Davis states that early recognition of malignancy of the large intestine is unusual This is due to the fact that the symptoms are obscure and resemble those of other conditions Blood in the stools may not be noticed by the patient or may be diagnosed by him as due to piles The obstructive phenomena are usually the cause of his seeking medical advice Constipation with colicky pains or melena is suggestive When once malignancy is suspected it can usually be diagnosed by careful and repeated examinations of the stools, which as a rule show blood and by fluoroscopic and X-ray examination The fluoroscope is very valuable as it shows the permanent defects caused by cancer

Cancer of the lower part of the rectum can be

and chronic diverticulitis, polyposis and tuberculosis Its differentiation from diverticulitis requires microscopic examination as even when the abdomen is opened the appearance of the two conditions is sometimes similar In polyposis there may be blood in the stools and pain, but the proctoscope may reveal a polyp and the fluoroscope shows no filling defect Tuberculosis is found more frequently near the ileocæcal region of the colon and less frequently as the anus is approached while the reverse is true of cancer Moreover in tuberculosis of the colon other tuberculous foci are usually present in the body and the filling defect is of a different character

The treatment is perhaps more hopeful than has been generally conceded as occasionally a very good result is obtained by wide dissection. Enlarged glands may be due to inflammatory reaction and hence do not necessarily preclude operation. A number of the author's patients in whom all glands examined showed malignancy lived more than five years after operation and one who had involvement of the levator ani muscle is alive at the end of eight years

End to-end or side to-side anastomosis is ideal As the end to-end anastomosis fails to unite in the rectum below the peritoneum total resection of the rectum is indicated. The Kraske operation was formerly used but an abdominal incision is now added. The patient's age, sex and general condition, however determine the procedure. The Kraske operation is best for stout persons. The advantages of the combined operation are a more radical removal of the disease and a better opportunity to determine operability and to make the proper type of artificial anus. If a long redundant loop of bowel is left it will act as a reservoir

MARCUS H. HOBART M D

Erdman S High Enterostomy for the Relief of Ileus Complicating Appendicitis. *Surg Clin N Am* 1921 1, 1663.

Erdman reports three cases in which high enterostomy was performed for the relief of ileus complicating appendicitis.

The first patient a man aged 34 began to have steady colicky pain in the lower abdomen with nausea but no vomiting on October 6 1921 Later the pain became localized over the appendix The bowels moved on the second and third days. On the third day dysuria supervened

On October 10 the patient was admitted to the hospital with a temperature of 101 degrees F The blood count showed 16 000 leucocytes and 88 per cent polynuclears. The right lower abdomen was rigid and there was marked rebound tenderness over the entire abdomen A small mass was palpable in the region of the appendix.

Operation was performed at once a completely inflamed. Two cigarette drains were inserted.

For two days following this operation the temperature remained elevated and the pulse became more rapid Abdominal distention became constantly more marked and there was vomiting at frequent intervals despite repeated lavage of the stomach. On the seventh day of the illness and the third after operation a small amount of gas and feces was passed following a colon irrigation combined with the administration of pituitrin. The pulse on this day was 144 and the general condition was very grave.

A high enterostomy was then performed The vomiting and distention were somewhat relieved but death occurred eighteen hours later No autopsy could be made.

The technique of high enterostomy as performed in this case was briefly as follows

An oblique intermuscular incision was made in the left side of the abdomen just lateral to the left rectus and a little above the level of the umbilicus Without trauma or unnecessary handling a short loop of distended intestine was drawn out of the incision On the convex surface a circular purse-string chromic suture was placed the intestine opened with the thrust of a scalpel a No 20 French catheter rapidly introduced for 3 in and the purse-string suture at once tied snugly The end of the catheter had been previously cut off and a lateral opening made in it near the tip The tube was then depressed along the convex surface of the bowel so that it lay in a furrow and the edges of the furrow were sutured together over the tube for a distance of 1½ in according to the Witzel method of gastrostomy The intestine was then returned to the peritoneal cavity and sutured lightly to the peritoneum The wound was not sutured but the tube was fastened to the skin edge with silk. A small rubber-dam drain was placed down to the peritoneum

The second patient a boy aged 8 years was admitted to the hospital [illegible] days after the onset of the illness with the same symptoms as the first patient described above On his admission to the hospital his temperature was 103 degrees F and the blood count showed 16,000 leucocytes and 90 per cent polynuclears

Operation was performed immediately a suppurative appendix being removed The appendix was surrounded by several ounces of purulent fluid (culture showed colon bacillus) and its tip lay to the left of the midline over the brim of the pelvis As there was practically no walling off a spreading peritonitis had developed A rubber-dam Mikulicz drain was inserted and the wound left unsutured

Following the operation the abdomen became distended and each day vomiting occurred several times. Colon irrigations and catharsis failed to obtain satisfactory returns On the seventh day after the operation a pocket of pus which had been felt through the rectum was drained through the appendix wound and about 3 oz of pus were evacuated from the depths of the pelvis On the thirteenth day a high enterostomy was performed

The vomiting never recurred after the operation and the distention was rapidly and markedly relieved. The boy was discharged from the hospital cured

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scess of the appendix. For two weeks he had been sick in bed The onset of the illness was characterized by general abdominal pain, nausea and diarrhœa After the first day the pain became localized in the right lower quadrant and remained there for

six days. Five days before the patient's admission

first case

For three days there was profuse drainage averaging about 1,500 c. cm. per day. The tube was removed on the fourth day, after which there was scarcely any drainage as the valve action of the enterostomy opening came into play and the wound healed very promptly. The convalescence was rapid in spite of a fecal fistula in the appendix wound which discharged from the fourth to the seventeenth day. The patient was discharged October 18.

From this limited experience the author concludes that much more efficient drainage of the toxic intestinal contents can be obtained by a high enterostomy than by a low enterostomy.

The relief of vomiting and distention is greater

The valve-like action of a properly performed jejunostomy results in automatic closure of the opening as soon as the tube is removed and no secondary operation for closure is necessary.

After primary relief of obstruction the tube may be used for the introduction of fluid.

MAURICE I. M.

Packard, H. Appendicular Lithiasis. Report of a Case Unique in the Annals of Surgery. *Bost. M. & S. J.*, 1921, clxxxv, 1060.

stone with apparently the hardness of porcelain. No pus was encountered. The hole was apparently caused by pressure necrosis. The stone, measured 4 by 2 by 1 cm. and on section was found to consist of inspissated fecal material and irregularly concentric deposit of amorphous bile salts.

FREDERICK CHRISTOPHER, M.D.

Mechling, C. C. Tuberculoma of the Ischiorectal Fossa. *Am. J. Surg.*, 1921, xxxv, 3.

Tuberculosis primary in the anorectal region is well known and may be present in the ischiorectal fossa without evidence of the disease in other parts of the body. In most cases reported in the literature, however, there were ulcerative lesions, fistulæ or miliary deposits which tended to break down and form tuberculous ulcers. In distinctly localized disease complete excision together with extensive actino-radiotherapy seems to give the best prognosis, but the patient should be examined frequently after the operation.

Mechling reports a case of tuberculoma of the ischiorectal fossa which caused pain and tenderness in the region of the rectum. A small round swelling developed about the anus and had continued to increase in size and tenderness for six weeks. Except for indigestion, constipation, weakness and bad luck, the history was negative.

On physical examination a hard, round, tender and cartilage-like mass the size of a hen's egg was felt in the ischiorectal fossa. The growth suggested a lipoma with a tough capsule. It seemed to be attached to the ischium and did not feel or appear to be due to inflammation. The skin over it was movable. There were no hæmorrhoids or mucous membrane lesions. The X-ray examination and the blood Wassermann test were negative.

Under novocaine anæsthesia the tumor was removed *en bloc* through a crescent-shaped incision between the anus and ischium. It contained thin pus. Pathologic examination showed it to be a tuberculoma. When the stitches were removed on the seventh day, pus escaped. The wound was then treated according to the Carrel technique. Smears taken on the fifteenth and twenty-fourth days showed tubercle bacilli. The wound was healed by the fortieth day. Since his discharge from the hospital the patient has been in good health.

WALTER C. BURNETT, M.D.

Dudley, G. S. Ischiorectal Abscess: Its Etiology and a Method of Treatment to Avoid Fistula and Recurrence. *Am. J. Surg.*, 1921, xxxv, 365.

On the second surgical division at Bellevue Hospital during the past three years, 95 per cent. of ninety cases of ischiorectal abscess resulted in complete cures, i.e., normal bowel control and no sinus. Of the remaining cases, one was a case of epithelioma, one was fatal because of gas bacillus infection, two were cases of tuberculosis, two were complicated by diabetes mellitus and in others there was a history of repeated operations in the treatment of the abscess. The usual sequence of events was (1) operative incision of an ischiorectal abscess, (2) the formation of a persistent sinus, and (3) recurrence of the abscess.

With regard to the relationship of ischiorectal abscess to pulmonary tuberculosis, Walsham cites 891 cases under treatment for three years in which there were only five cases of anal fistula and two cases of ischiorectal abscess. In 133 autopsies only one anal fistula was found. Cant states that tuberculosis is present in from 4 to 6 per cent. of cases of anal fistula. Dudley has noted that only a few abscesses and fistulæ are proved tuberculous by histologic examination—not more than 2 per cent.

Except in cases of hæmatogenous origin, true ischiorectal abscess is practically always secondary to a break in continuity of the anal mucosa. In the beginning the process may be considered as a blind internal anal fistula with abscess formation. Hard fæces or a sharp foreign body may lacerate the mucosa and open a path for infection of the poorly

resisting fatty tissue Other less common causes are inflamed and thrombosed hæmorrhoids rectal ulceration polypi and neoplasms Debilitating illnesses such as influenza and pneumonia are not uncommon by complicated by ischiorectal abscess

The weakest point in the bowel wall is the small anal canal between the two sphincter muscles which is separated from the fatty tissue of the ischiorectal fossa only by tendinous insertions of longitudinal muscle fibers This becomes more pronounced with age and prolonged straining during defæcation

During the last three or four days before the patient seeks medical advice the ischiorectal abscess compresses the fat of the fossa thus permitting union of the original injury to the mucosa Consequently at operation the point of infection may be difficult to find

The surgical treatment has two main objectives first to evacuate the pus and provide drainage second to determine the point of entrance of the infection The author recommends pre-operative castor oil catharsis two soap-suds enemata in the evening

ual stretching for five to ten minutes to permit inspection of the anal mucosa A definite defect or locally inflamed indurated area on the mucosa is then seen The abscess is incised by an ample radial incision After retraction of the wound edges a second search for the tract is made with the probe

should be laid open by incision and division of the external sphincter to place the tissues at rest Pus is taken for bacteriological study and a section of the abscess wall for histological examination The wound is packed with petrolatum gauze

Postoperatively the gauze is changed and the wound irrigated following the first bowel movement (usually the third day) and subsequently each day The wound heals by granulation from the depths Daily hot sitz baths are beneficial hastening convalescence If an internal opening was not found at operation a search is made for it at the dressings with the probe externally and the finger in the gut lumen. If it is located the patient is again anæsthetized the tract is laid open and the external sphincter is divided

If the abscess were opened and drained simply by a skin incision the cavity would contract to a small persistent sinus and recurring abscesses might form as the result of renewed infection from the rectum In unusually large abscess or an abscess involving both ischiorectal fossæ may required a second operation for complete cure.

In Dudley's opinion Elting's method of dissecting back and resecting the diseased mucosa and suturing healthy mucosa to the anal mucocutaneous margin is as dangerous as the Whitehead method

WALTER C BURKET M D

Pennington J R A Classification of Rectal Fistulæ: The Treatment of Each Variety *Am J Surg* 1921 xxxv 372

In reviewing the development of the rectum and anus the author describes particularly the pectinate line with its sinuses crypts and columns of Morgagni which marks the junction between the rectum

funnel This he believes marks the division between visceral and perineal diseases

Pennington classifies fistulæ according to the anatomical location of the inner opening as follows anal (opening located in the anus) anorectal (opening located at the pectinate line) rectal (opening proper) bowel wa

terms such as horseshoe watering pot multiple etc are merely expressions of complexity multiplicity position or shape Between 85 and 90 per cent of fistulæ are of the anorectal type

Anal fistulæ require only incisions and anorectal fistulæ complete dissection and immediate suture Rectal fistulæ may be treated by the author's seton method and rectosigmoidal fistulæ by the author's method of ligation

The gravity of the condition depends upon the location of the inner fistulous opening Rectal fistulæ are more serious than anal fistulæ The number of external openings has little to do with the gravity of the condition

In 6 296 cases reported the external opening was in the median line in 1 262 (in 154 behind the anus) and on the sides in 5 437 (129 more being on the left side than on the right)

The author calls attention to the prevention of fistula by early evacuation of the abscess followed by drainage and filling with bismuth paste every two three or four days

WALTER C BURKET M D

Ruebsamen W New Operative Principles for the Treatment of Vestibular Anus (Neue Operationsprinzipien bei Anus praeternaturalis vestibularis) *Zeitschr f Geburtsh u Gynæk* 1921 lxxxiv 46

By the term vestibular anus is meant a developmental anomaly of the external genitals in which the rectum empties into the urogenital sinus because the cloaca into which the bladder vagina and gut empty in the early embryonic stage is persistent In some of these malformations there is a normal anus in addition to the abnormal opening

which in addition to a normally situated anus there was an abnormal opening of the gut in the vagina which was surrounded by only rudimentary

sphincteric muscles and necessitated surgical treatment

The operation was done under local anesthesia. As the vaginal fistula was markedly altered by cicatrices from a previous operation, the incision was made around it at a distance of 3/4 cm. The edges of the wound were well mobilized and closed with a mattress suture. The line of suture was invaginated toward the rectum in a transverse direction by means of double catgut. The fistula was then further mobilized proximally so that it could be drawn out with the rectum. A transverse incision 3 cm. long was made in front of the anus, and the sphincter ani muscle, which was normally developed, was exposed.

the sutures with which the fistula was coopted were passed to the inner surface of the anal skin and tied. In the final step the vaginal wound edges were resected, the wound was closed after suture of the levators with buried catgut sutures, and the

cases reported by other authors. Under certain

are associated with it. If the described operative procedure is to be used for cases with an associated

normal location. The closure of the abnormal anus and partial proximal displacement of the sphincter should then be done in the manner described. Bonar (Z)

Gant, S. G. The Relation of Pulmonary and Ano-Rectal Tuberculosis to Fistula in Ano. *Am. J. Surg.*, 9: xxv, 368.

Of 5,000 fistulæ treated by Gant, only 10 per cent were tuberculous. The records of institutions for the treatment of pulmonary tuberculosis show that from 1 to 30 per cent of patients with that condition have fistula in ano, but after a study of statistics from several sanitaria and his own cases, the author concludes that 5 per cent is more nearly

5 of

95

other structure, usually the lungs. Tuberculous elsewhere in the body may be secondary to anorectal tuberculous ulceration and fistula, especially following operation.

The author classifies anorectal fistulæ according to their healing time and relation to tuberculosis as follows: (1) ordinary fistulæ in cases of pulmonary tuberculosis, which usually heal rapidly after operation; (2) tuberculous fistulæ in otherwise healthy subjects, in these cases it is unsafe to give an opinion as to the time required to effect a cure; and (3) tuberculous fistulæ in cases of pulmonary tuberculosis (double infection may so devitalize the patient that neither condition will heal).

The early symptoms of tuberculous fistula uncomplicated by lung involvement are a discharge, rectal discomfort, and irritation of the peri-anal mucosa and skin for a long period of time. As a rule cases of pulmonary tuberculosis with tuberculous fistula in ano have the usual symptoms and signs of pulmonary tuberculosis. Some patients, however, have no symptoms suggesting tuberculosis, and the character of the fistula is discovered only when the tubercle bacilli are found in the discharge. The fis-

based are summarized as follows:

Ordinary Fistula	Tuberculous Fistula
Internal and external openings small, round, and situated in the center of an elevation	Openings large, irregular, and with undermined purplish edges
Buttocks plump	Buttocks emaciated
Hairs of peri-anal region normal	Hairs abundant, long, and silky
No cachexia	Cachexia
Face, ears, and nose unchanged	Face pinched, nostrils dilated
Voice natural	Voice husky
No loss in weight	Marked emaciation
Discharge slight, thick, and yellow	Discharge thin, profuse, and whitish
Probing difficult	Probing easy
Appetite normal	Appetite poor
Digestion good	Indigestion
No night sweats	Exhausting night sweats
	Sleep disturbed
No lung involvement	Pulmonary lesion with or without hemorrhages
Discharge contains colon bacilli, streptococci, or staphylococci	Discharge contains tubercle bacilli
Tight sphincter	Patulous anus
Temperature normal	Afternoon rise of temperature

healing is slow Occasionally primary and secondary tuberculous fistulæ and ordinary sinuses in phthisical subjects are not healed by palliative or operative measures and the patient dies of phthisis or exhaustion due to local lesions. Many apparently otherwise healthy persons have latent tuberculous foci in the lungs and die shortly after operative treatment of the fistula, probably because of lighting up of the tuberculous process by the ether or other general anæsthetic.

Palliative measures give comfort and strengthen the patient for the operation. These consist of enlarging the fistulous openings, cleansing and draining the sinus, stimulating the ulcers the use of salves, suppositories or dusting powders to relieve the pain and allay the irritation of the anal mucosa

In some cases a cure has been obtained by operation on the fistula followed by mountain life Anorectal sinuses and the majority of ordinary fistulæ in tuberculous subjects are readily operated upon under local anæsthesia Rarely deep and complicating fistulæ requiring general anæsthesia are divided under anæsthesia induced with gas or chloroform but never with ether as the latter aggravates the pulmonary lesion The author recommends infiltrating the bridge overlying the fistulous tract with ½ per cent eucaine. After division of the sinus the removal of overhanging edges with the knife scissors, or cautery the wound is treated with phenol or cauterized to prevent extension by any injured lymph or blood vessels, and packed with gauze to prevent bleeding

After the operation special stress is placed upon general measures used in the treatment of tuberculosis.

Gant prefers operative division to excision of tuberculous fistulæ. The ligature operation has been abandoned since local anæsthesia has been used

WALTER C BURKET M D

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Walters, W : Pre-Operative Preparation of Patients with Obstructive Jaundice. *Surg., Gynec. & Obst* 1921 xxxii, 651

A study was made of cases in which death oc

the venous blood.

More than one half of the deaths following operations upon jaundiced patients were due to hæmorrhage, while in the cases of unjaundiced patients death from hæmorrhage was exceedingly rare although the operation was similar Thus it would seem that death from hæmorrhage in such cases is dependent on a coagulation time of more than ten minutes and a marked degree of jaundice. The hæmorrhage seems to be due to a continual oozing from traumatized surfaces rather than bleeding from several arteries

In view of the work of King Bigelow and Pearce the belief seems justified that calcium offers the best means of preparing jaundiced patients for operation as it reduces not only the coagulation time of the blood but also the toxicity produced by the circulating bile pi
gested the in
10 c. cm of a
in redistilled water which was given each of four patients with obstructive jaundice who had an abnormally high blood coagulation time lowered the coagulation time to normal after three injections on successive days. In addition these patients were given calcium lactate by mouth in doses of 100 gr daily

Mann has been able to keep dogs alive for from twenty to thirty four hours after the removal of the liver by intravenous, subcutaneous and intraduodenal injections of glucose In view of this work, jaundiced patients in the Mayo Clinic have been fed large quantities of carbohydrates and the amount of glucose has been increased by Murphy drip proctoclysis of a 15 per cent glucose solution in tap water one hour on and one hour off Four thousand cubic centimeters of water are given by mouth every twenty four hours to increase the body fluids and to aid in the elimination of bile pigments. If the patient does not respond to this regime, transfusion of blood is indicated twenty four to forty-eight hours before operation

In operations for obstructive jaundice the various steps of the operation should be carried out with the utmost gentleness care being taken not to traumatize the tissues especially those of the liver For this reason cholecystectomy should not be performed at the primary operation if it can be avoided.

Lunglay G J : The Difficulties in the Diagnosis and Treatment of Hepatic Abscess. *Brit M J* 1921 ii, 1073

Hepatic abscess has assumed new interest among British physicians because of its relative high frequency following over seas service, the difficulties of accurate diagnosis, and the striking results of emetine treatment. Surgical treatment of liver abscess may be followed by recurrence as in the following cases

The first case was that of a man aged 43 who contracted dysentery in Palestine in 1918 A large liver abscess was opened and drained Two years later he was admitted to a hospital with intense hepatic colic and a markedly enlarged liver X ray examination showed fluid at the right base and a fixed diaphragm. Under treatment, the diaphragm and liver returned to normal About one year later an acute liver abscess developed from which over 2 pints of pus were evacuated He made a good recovery

The second case was somewhat similar except that all the symptoms and signs of an acute hepatic abscess disappeared under emetine treatment and the patient has since remained well

The syndrome of dysentery pyrexia leucocytosis and hepatic pain and enlargement is generally diagnosed as hepatic abscess but it is important to bear in mind the fact that although the right dome of the diaphragm may be pushed up and fixed, the pathologic condition may be acute amebic hepatitis This is the early stage of the disease in which errors of diagnosis are frequent and emetine effects a cure It is usually impossible to differentiate hepatitis from abscess unless there is an actual bulging Emetine treatment consisting of 1 gr of the hydrochloride given hypodermically night and morning may obviate much unnecessary surgery The rapid diminution in the size of the liver can be observed roentgenographically and in the course of one or two weeks the patient's condition is comparatively normal without pain or fever

The temperature curve in the early stages of the disease resembles very closely that of an enteric infection but speedily returns to normal under emetine treatment

Two forms of dysentery are frequently noted in amebic infection In one diarrhea occurs at night the bowels acting three or four times, while in the other there are two or three loose evacuations in the morning between breakfast and luncheon followed by intestinal quiet for the rest of the day The condition is frequently neglected until hepatic infection occurs The author cites an illustrative case and a series of amebic abscesses in the lesser peritoneal cavity in which recovery followed surgical intervention combined with emetine treatment Two cases of hydatid cyst of the liver are reported to illustrate points in the differential diagnosis

V C Brames M D

Judd E S Surgery of the Gall Bladder and Bile Ducts (Journal of the American Medical Association Vol xcii No 9 pp 670-674)

In cases of infection of the gall bladder and bile ducts early operation is usually followed by good result The onset of jaundice or the extension of infection to the pancreas increases the severity of the condition

Recent experimental work by Mann has shown that total hepatectomy in the dog is followed by death within a few hours but if glucose is introduced into the blood stream immediate resuscitation occur and life may be prolonged for many hours. It is not known whether the condition which occurs during jaundice is due to toxemia disturbance of liver function or the influence of bile in the blood. Bell's studies on biliary cirrhosis have demonstrated the regenerative powers of the liver when the gall-bladder is anastomosed to the intestine after total occlusion of the common bile duct This work suggests the possibility of some temporary substitute for this function which will favor complete recovery

ner

The route of infection is probably by way of the blood stream and lymphatic vessels There is little clinical evidence to indicate duct borne infection Cholecystitis and hepatitis are frequently associated, and infection gaining entrance by the portal circulation may pass to the gall-bladder by means of communicating lymphatics between the gall-bladder and liver In the associated lesions pancreatitis is secondary to cholecystitis and the infection may extend from the gall bladder to the pancreas by way of the lymphatics Lesions in the liver and pancreas frequently coexist with inflammation in the stomach

phatics

Mann has produced specific cholecystitis in the dog by injecting chlorinated soda intravenously the solution gained entrance to the tissues of the gall bladder through the blood stream Therefore any material in the blood may become lodged in the tissues of the gall-bladder

The recurrence of symptoms after operations on the gall bladder may be due to the formation of stone or to retained infection In some instances hepatitis and pancreatitis are the causes and as a rule gradually disappear Sometimes the remaining symptoms are due to an ulcer or an inflamed appendix which should have received attention at the original operation

In a small group of cases at the Mayo Clinic in which cholecystectomy had been performed for cholecystitis complete relief of symptoms lasted for from six months to six years Recurrence of typical hepatic colic then followed in some instances with slight jaundice At a second operation no lesion was found except a slight degree of hepatitis or pancreatitis Drainage of bile was established by placing a small tube in the duct and the patients were apparently permanently relieved These cases probably

bladder because so few patients have such symptoms after cholecystectomy The question arises as to whether these patients should have had common duct drainage at the primary operation

The types of cholecystitis may be grouped clinically as follow

attacks may recur for several years and gradually produce intermediate symptoms referable to the

digestive tract thus developing into cases of gall bladder dyspepsia

Type 2 is the so-called gall bladder dyspepsia which may or may not be preceded by intermittent hepatic colic In the absence of a history of typical attacks the diagnosis is difficult Infection of the appendix or gall bladder may be the cause of dyspepsia but in the absence of local symptoms the diagnosis of secondary dyspepsia is hazardous The dyspepsia of ulcer has a characteristic and definite sequence of symptoms relief obtained by food or alcoholics and periodicity of pain. In cases of gall bladder disease the symptoms are aggravated or are not affected by food Pain is often constant through the day but rarely gives trouble at night Although the roentgenogram is efficient in the recognition of ulcers of the stomach or duodenum it is of little value in the diagnosis of diseases of the gall bladder even when stones are present The method of diagnosing lesions of the biliary tract by study of the bile obtained after the introduction of magnesium sulphate into the duodenum through a Rehfuss tube has not proved of great importance in the hands of Hartman at the Mayo Clinic The condition of the bile does not always reveal the conditions in the biliary tract

Type 3 is infection which is retained in the gall bladder over a long period and acts as a focus for more or less general infection The diagnosis is difficult to establish It is essential that there be some local evidence of disease before treatment is considered

Type 4 is disease of the gall bladder associated with migraine At present the relationship cannot be explained but treatment of the gall bladder permanently relieves the migraine It is possible that relief might have been obtained by any sort of operation as is often the case in epilepsy

Type 5 is disease of the gall bladder associated with changes in the cardiovascular system such as endocarditis myocarditis or coronary sclerosis In the treatment the best compensation possible for the cardiac condition should be obtained and an operation on the infected gall bladder then performed

Most cases of cholecystitis and cholangitis are surgical In chronic cases operation may be done at the most convenient time. In acute attacks accompanied by jaundice it is usually best to wait until the attack has subsided always keeping in mind however the possibility of rupture of the gall bladder or extension to the pancreas If a severe degree of pancreatitis is suspected immediate operation offers the best chance for recovery In cases of acute pancreatitis and necrosis operation must be performed with the least amount of trauma and usually should consist of drainage of the gall-bladder and the placing of several small drains to the capsule of the pancreas A secondary operation may be necessary

The presence of jaundice presents a serious complication If possible operation at this time should be avoided Operation on patients with beginning jaundice is comparatively safe but in cases of well established jaundice the risk is high When jaundice is decreasing operation should be deferred until it has reached its minimum The great danger is hæmorrhage from the cut surfaces or the mucous membrane The coagulation time and calcium time are not always safe indexes to the tendency to bleed Immediate operation is demanded even in the presence of jaundice when the common duct is completely obstructed In these cases pre-operative preparation to lessen the liability to postoperative bleeding should include blood transfusion and the intravenous administration of calcium Transfusion after operation is also of value

Complete occlusion of the common duct is a serious embarassment to liver function Urea metabolism bile secretion the formation of glycogen and the detoxicating power of the liver are all or in part destroyed and a state of cholæmia ensues. Transfusion of whole blood is at present known to be a beneficial procedure When bile ceases to drain satisfactorily after drainage has been instituted serious trouble is apt to follow In such cases transfusion of whole blood frequently reestablishes and sustains the flow V C Burdick M D

Magoun J A H Jr and Renshaw K. Malignant Neoplasia in the Gall Bladder *Ann Surg* 1921 lxxiv 700

The authors report their studies on a series of eighty four cases of malignant neoplasia of the gall bladder collected from 7,878 operations for gall stones in the Mayo Clinic between January 1907 and January 1921

Males and females were afflicted in the ratio of about one to four Seventy five per cent of the patients were between the ages of 50 and 70 years

Carcinoma is the most common type of malignant neoplasm of the gall bladder Sarcoma is exceedingly rare In a large number of cases gall stones were present Early cholecystectomy for stones will either prevent the development of malignancy or reveal the condition in its incipiency

Twenty nine of the thirty-eight patients on whom cholecystectomies were performed had had symptoms referable to the gall bladder for more than one year nine had had symptoms for less than one year

If the condition is operable cholecystectomy should be performed Cholecystostomy should be done only when there is a severe infection of the gall bladder or when a path must be formed for the introduction of radium (W J Mayo) As cholecystostomy for stones had been performed elsewhere in five of the eighty four cases it is evident that malignancy may develop in gall bladders that have been drained

years after the operation The diagnosis in these cases was gall-stones in three gall-bladder disease in three and gastric carcinoma in one In the last case adhesions had developed between the gall-

in one

Amberger: Radical Operation for Carcinoma of the Common Bile Duct (Radikal operiertes Carcinom des Ductus choledochus) *Arch f klin Chir* 1921 cxvii 189

This article reports a case of carcinoma of the common bile duct operated upon successfully

half years ago The patient a man 52 years old, was admitted to the medical division of a hospital April 13 1919, after having suffered with a gastric disturbance for two months Previously he had always been well The gastric symptoms (pain, nausea and anorexia) had gradually decreased but were followed by a severe grade of icterus and tenderness of the gall-bladder When the patient was placed on a meat free diet occult blood was repeatedly demonstrated in the stools The gall-bladder was distinctly palpable

After observation for two months, the patient was admitted to the surgical division He was then very much emaciated and had marked icterus and pruritus

after a

and dig

common

At operation an incision was made at the costal *border and adhesions were broken up* The gall bladder was found to be enlarged and puncture showed white bile At the juncture of the common bile duct and the cystic duct and surrounding the bile duct was a hard tumor the size of a cherry The hepatic duct was about as thick as the small intestine but the caliber of the efferent bile duct was normal The tumor was removed The defect between the hepatic and common bile ducts measured about 4 cm The stumps could be approximated but circular suture was impossible because of the great difference in their size Therefore a T tube was inserted and a partial suture was done, chiefly on the posterior wall A safety drainage tube was then laid beside the T-tube and the abdomen closed

The postoperative course was smooth Colored stools appeared on the fourth day The T-tube was removed after three weeks, and the tampons and other drainage materials were removed twelve days after the operation The patient left the clinic January 9 1920 free of symptoms He has now been well for over a year and has been able to follow his occupation. An attack of icterus since the opera

a primary tumor

The author believes that the primary circular anastomosis of the hepatic and common bile ducts is the ideal operation This, however is applicable only rarely When it is impossible he recommends the method he selected, that is, partial suture and the use of the T tube as has been done by Jenkel, Verbogen, Wilms, Propping and Doberauer

GLASS (Z)

Lund, F B Surgical Treatment of Acute and Chronic Pancreatitis. *Bost M & S J*, 1921 clxxxv 77

In pancreatic disease the indications for surgical *intervention may be acute and imperative*, as in

associated with cancer of the pancreas It has been found that only an exceptional arrangement of the common and pancreatic ducts would allow bile blocked by a stone to enter the duct of Wirsung Not infrequently this duct and the pancreatic ducts open by two separate openings close to each other in the papilla and such blocking is rendered impossible Neither can it be produced when as is sometimes the case the duct of Santorini is the chief drainage canal of the pancreas, as a free anastomosis between the two ducts then enables either of them to take on the chief drainage function Gall-stone disease, cholecystitis, adherent ulcer of the posterior surface of the stomach and even retroperitoneal *infection from appendicitis are often accompanied by* chronic swelling and inflammation of the pancreas

As our knowledge of gall bladder disease has increased we have come to believe that the primary

by a theory of the invasion of the pancreatic lymphatics from the inflamed gall-bladder stomach, or retroperitoneal tissue

Such a theory would suggest for the treatment of chronic pancreatitis, not drainage of the infected

several recoveries from chronic pancreatitis following drainage of the bile ducts by cholecyst

enterostomy The gall bladder should never be removed for pancreatitis unless it is known definitely that there are no stones in the common duct A fact indicating the direct dependence of pancreatitis upon infection extending from the gall bladder is that localized abscesses of the head of the pancreas with fat necrosis have been found several times by the author in operating upon a gall bladder when operation was delayed for several days. The possibility of the development of pancreatitis is therefore an argument against delay in acute conditions of the gall bladder

J D Ellis M D

MISCELLANEOUS

Litchfield, H. R and Dembo L. H Acute Abdominal Conditions in Children: An Analysis of Two Hundred Cases. *Arch. Pediat* 1921 xxxiii 747

Of the 200 cases reviewed 124 were cases of appendicitis In fifty nine the appendix had ruptured and peritonitis had developed in thirty-one there was acute congestion in fifteen an abscess in eleven acute suppuration and in eight inflammation of the chronic type Seventy-six of the patients were males and forty-eight were females Their ages ranged from two weeks to 12 years The average age was 8 years The onset of the condition was sudden in 102 cases and gradual in twenty two cases Abdominal tenderness was present in ninety six, and rigidity in eighty-eight Only sixteen presented the triad of rigidity localized tenderness and distention The lowest leucocyte count was 11,800 the highest 30 000, and the average 16 000 Operation was performed in 105 cases. Of the nineteen patients not operated upon, twelve were too ill six refused operation and one recovered under medical treatment. Peritonitis complicated sixty three cases bronchopneumonia three and renal conditions nine The mortality was 25 per cent the vast majority of deaths being those of patients with complications. Two case histories are given

There were eleven cases of intussusception The youngest patient was eight months old and the oldest nine years Eight were males and three were females The onset was sudden and the clinical picture was characteristic in practically every case As a rule the lesion was at the ileocecal juncture

Twelve cases of tuberculous peritonitis with acute abdominal symptoms were studied eight those of females and four those of males Only two of the patients were white children The von Pirquet test was positive in ten cases The average leucocyte count was 9 000 General adenopathy was noted in ten cases

The remaining fifty three cases included cases of acute indigestion ileocolitis typhoid perforation strangulated hernia respiratory infections with acute abdominal symptoms and one case of renal sarcoma

The article is summarized as follows

1 Appendicitis is one of the most common of the acute abdominal conditions occurring in childhood.

2 Acute gastro-intestinal disturbances are apt to simulate the surgical abdomen

3 The symptoms and signs of the acute abdomen in the child do not always conform to those of any one condition

4 Mistakes are often made in the diagnosis because the examining physician looks for characteristic clinical features and is misled by an atypical syndrome

Carl R. Stephie M D

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES JOINTS MUSCLES TENDONS ETC

Vander Veer E. A. and Dickinson, A. M : Fragilitas Ossium *Ann Surg* 1921 lxxiv 629

Fragilitas ossium is characterized by fragility of the bones and blue sclerae.

No etiologic theory has been proven. Syphilis was considered the cause but is no longer so regarded Heredity plays an important part. In 9 or 10 per cent of cases there is a definite family tendency

Ossification of the cartilage is delayed or absent and very little dense bone is formed. The activity deposit of deficient

as a rule in such cases the bones of the head are fractured Most infants suffering prenatal fractures are born dead or die soon after birth The earlier fracture occurs in

In the case reported by the author the teeth were almost translucent

Medication is of no avail Many glandular and bone marrow preparations and tonics have proven useless The treatment is merely symptomatic.

John Mitchell, M D

McWilliams, C. A.: Central Bone Abscess. *Ann Surg* 1921 lxxiv 568

in the medullary cavity or cancellous tissue of a long bone, without any external fistula or sequestration and characterized frequently by an extensive productive osteitis often of many years standing

McWilliams quotes several recent authors as stating that central bone abscess or Brodie's abscess is a tuberculous infection of the bone While it is

to pyogenic organisms usually staphylococci The abscess must be differentiated from a bone cyst or tumor syphilitic osteitis and periostitis and bone tuberculosis

any recognized cause a dull ache develops in a local ized area Gradually this becomes boring and severe and much worse at night The pain is intermittent

The most frequent locations of Brodie abscesses are the head of the humerus femur and tibia and the shafts of the humerus radius femur and tibia

center of the dense bone The presence of a translucent area at once makes the diagnosis evident

The author reports a number of characteristic cases of the disease His conclusions are as follow

A tender swelling of a bone associated with inter

Subjective symptoms may be absent In other cases pain may be due to joint movement or muscular contraction Objective signs may be undetected until demonstrated by the X-ray or by fracture at the site of the lesion There is usually neither heat nor redness The superficial veins over the swelling may be enlarged because of pressure Occasionally the patient limps Slight atrophy of the adjacent soft parts occurs only in the later stages of the

The diag
the location
of trauma,
motion and muscle spasm long duration without exacerbations or metastasis and the X ray findings

The condition must be differentiated from a malignant bone tumor and bone tuberculosis All three occur early in life and tuberculosis and sarcoma may have the same location Also in all three there

swelling local heat and muscle atrophy noted in tuberculosis or sarcoma near joints Hemorrhagic osteomyelitis may be stationary for years, while tuberculosis and sarcoma continue to progress Roentgenograms of cases of tuberculosis do not

of a bone

consists of complete curettage of the hemorrhagic membrane and of the whole cavity and recesses. The cavity may be filled in with bone chips of healthy cortex, the periosteum sutured, and the skin closed without drainage A splint should be applied if there is a large cavity with a thin cortex and the supporting brace should be worn until the X ray demonstrates sufficient new bone formation to permit function The prognosis is generally good.

RUDOLPH S REICH, M D

Arnold E H Hemorrhagic Osteomyelitis
Boston M & S J 9 X 77

Hemorrhagic osteomyelitis is regarded as a rare condition possibly because it is often unrecognized It occurs in childhood and youth and usually attacks spongy bone

A cavity is formed in the spongy part of the bone and becomes progressively more regular in outline It is filled with a dark brown jelly like mass containing uncoagulated blood and is lined by a brownish-red membrane which is fairly dense friable and about $\frac{1}{8}$ in thick It continues to expand but rarely ruptures unless there is a spontaneous fracture When this occurs there is a regular smooth swelling but no other signs of inflammation until the condition progresses Microscopic examination reveals a hemorrhagic extravasation with young fibroblastic tissue and many giant cells of the foreign body type due to the presence of hemorrhagic granular tissue The fibroblasts form collagen fibrils which cause formation

Geist, E. S. Osteomyelitis of the Pelvic Bones
J Am M Ass 1921 lxxvii, 939

Bergman compiled thirty five cases of osteomyelitis of the pelvic bones from the literature In

performed with good results

The author reports six cases, five of which were those of children In three the ilium was involved in two the ischium and in one, the pubis. All reacted promptly to wide opening, free drainage, and the removal of sequestra In every instance the roentgen-ray findings were positive and of great diagnostic aid. The infection was due to the staphylococcus pyogenes aureus All cases presented a definite leucocytosis from 12,000 to 20,000

In cases in which the ilium was involved the diagnosis was based on the history the character of the pain, and a positive roentgen ray examination At operation pus was always discovered on the visceral side displacing the peritoneum and the amount of sequestrum was small In one of the cases of involvement of the ischium a sinus near the anus was discharging pus and the condition had been diagnosed previously as osteomyelitis of the femur The X ray findings combined with the general history made the diagnosis easy In the case of involvement of the pubis, the pubic infection was secondary to a pus infection elsewhere

F W Carruthers M D

Dobrovolskaia N Costal Osteochondritis Following Exanthematous and Recurring Typhus and Its Treatment with Iodine (Osteochondrites costales consécutives au typhus (exanthématique et récurrent) et leur traitement par l'iode) *Presse méd* 1921 xxix 961

In a review of the literature the author was unable to find the record of a single case of costal osteochondritis following typhus fever In this article he reports several cases which developed during the typhus epidemic in Russia in 1919-20

The onset of the costal lesion usually occurs during the period of convalescence two or three months after the attack of fever Its first manifestation is usually noted at the costochondral juncture The lesion is diffusely infiltrated at the onset but later becomes circumscribed and then may remain without any visible change for months Softening ultimately occurs and an abscess with a fluctuating center is formed Evacuation of the abscess yields a yellowish pus This the author has found to be sterile Many of the patients have a tuberculous diathesis or lues

The treatment employed by Dobrovolskaia consists in rest out of door life heliotherapy general dietetic measures, and the intramuscular injection of iodine with liquid iodoform as proposed by Hotz

sis and aids in neutralizing the toxins Local surgical measures are strictly contra indicated The injection of iodine is not indicated in lesions of the lungs and kidneys Headache or vomiting following the injection indicates the discontinuance of the medication for three or four weeks and a decrease in the initial dose. A complete cure was obtained in the majority of cases.

Loyal F Davis M D

Ballenger E G and Elder O F The Treatment of Gonococcal Arthritis with Aspirated Synovial Fluid Injected Intramuscularly *Surg Gynec & Obst* 1921 xxxii 575

Except in acute traumatic conditions little benefit may be expected from the treatment described when the hydrocele or synovial fluid is not infected and is free from pus cells.

Prompt improvement and remarkable cures have resulted in all cases of acute gonococcal arthritis Since the authors began to employ intramuscular injections of synovial fluid they have found it unnecessary to resort to any other treatment such as the use of vaccines sera local applications fixation venesulotomy etc

Restoration to normal has been prompt in all of the acute cases, the relief of pain occurring nearly always within twenty four hours The ultimate results have been equally gratifying no ankylosis complete or partial has followed this treatment In addition to the improvement in the joints ther was cessation of the symptoms of complicating acute conditions such as epididymitis prostatitis posterior urethritis and seminal vesiculitis, and in cases of hyperpyrexia there was an immediate drop in the temperature

The method is possible of course only for patients who have a collection of fluid in the synovial space

Reactions following the injections were usually mild or absent.

All of the injections were given into the gluteal muscles and were repeated every two to seven days The amount injected varied from 15 to 50 c cm The authors are now under the impression that the larger doses are the best in spite of the occasional slight increase in the reaction the production of chills, and a momentary rise in the temperature The average number of injections administered to each patient was three but the treatment was continued as long as there was any fluid to be aspirated

In the authors opinion this plan of treatment may be applied also to other conditions such as tuberculous pleurisy with effusion E F Hess M D

Goljanizki I A Necrosis of Costal Cartilage Following Relapsing Fever (Zur Frage der Rippenknorpelnekrose nach Recurrens-fieber) *Sbornyk d Ges f Ihcor i u prakt Med* Astrachane, 1921

The author observed twelve cases of necrosis of the costal cartilage following relapsing fever Nine of the patients were between 25 and 32 years of age The first symptoms pain and swelling appeared from two to two and one half months after the fever Fistula developed in nine cases, and swelling alone in three cases In three cases of fistula there were also closed swellings. The number of cartilages diseased ranged from four to six.

Operation was performed in most cases two or three months after the relapsing fever but once after ten months and twice after seven months Usually the cartilage was exposed by a flap incision The perichondrium was then split lengthwise the cartilage excised and the stump covered with muscle Three patients were operated upon four three and two times respectively and the rest once Ten patients were cured and two were discharged before treatment was completed. The pleura and the internal mammary artery were each injured once during the operation The duration of treatment in nine cases averaged thirty days

individual cases were treated three hundred and forty-seven, one hundred and seventy-four and one hundred and thirty-one days

The pathologico-anatomic changes were as follows (1) funnel-shaped erosion of the surface of the diaphysis (2) erosion of the edges of the diaphysis (3) distension and erosion of one epiphysis (4) swelling and erosion of both epiphyses (5) complete erosion and sequestration of the whole

fæcalis alcaligenes, and did not form gas typhus serum was not agglutinated

The microscopic examination of the cartilage in all of the cases showed very marked senile changes, degeneration in layers and vascularization in one case tissue resembling bone marrow was found The necrotic areas, which were filled by granulations showed all the stages of transition from completely necrotic cartilage to normal cartilage showing only senile changes Leucocytic infiltration was

every infection running the course of a bacteræmia

4 Conservative treatment (iodine, heat mud baths, sanatorium care, and heliotherapy) is applicable only to the first two forms of changes mentioned and even then only in the absence of fistulæ

4 The best results are obtained by operative treatment—wide exposure and excision of the suspected cartilage, suture and drainage

5 In the differential diagnosis, tuberculosis, *syphilis, and actinomycosis are excluded by the* acute character of the condition. The preceding

microscopic examination of the cartilage clinch the diagnosis

6. The X ray facilitates the diagnosis and treatment. Reprinted (Z)

Steindler A : Operative Methods and End Results of Disabilities of the Shoulder and Arm. *J Orthop Surg* 1921 n s nl, 653

photograph and by graphic records of progress.

For contractures around the shoulder producing adduction and inward rotation manipulation is done under anæsthesia without excessive force The arm is then maintained in outward rotation and abduction on an aeroplane splint The after treat

treatment

If the contracture does not yield to manipulation, tenotomy of the subscapularis and pectoralis major must be done In refractory cases it may be necessary to cut also the short head of the biceps, the coracobrachialis, and the latissimus dorsi Five cases were treated by manipulation and six by open operation In the operative cases the results were good in four fair in one and undetermined in one

Arthrodesis of the shoulder is indicated in flail shoulder paralysis of the deltoid from poliomyelitis which does not improve under conservative treatment, and traumatic ankylosis in poor position with atrophy of the deltoid The joint is reached by separating the deltoid fibers through a skin-flap incision The acromion is cut off an inch from the edge and turned upward The head of the humerus is then pushed through a longitudinal incision in the capsule and denuded After operation the arm is held in a cast in abduction at 90 degrees for two or three months Then follow massage and exercises in raising the arm by means of the scapular muscles This operation may be done as early as the fifth year of age. The results in nineteen cases were good in fourteen, fair in two and undetermined in three.

was done also in two, arthrodesis of the wrist in four both elbow-plasty and arthrodesis of the wrist and in one tendon transplantation at the wrist

For flail elbow a transposition of muscles has been devised with the object of furnishing limited flexion power of this joint The muscles used are the pronator teres, flexor carpi radialis, palmaris longus, *and flexor carpi ulnaris. They are dissected off from* their common origin on the inner epicondyle of the humerus and re-attached 2 in higher into a point of the intermuscular septum between the brachialis anticus and the triceps muscles The elbow is held in acute flexion for two months Massage and exercises are included in the after treatment The function-results in seventeen cases in which this operation was done were good (active flexion in any position) in nine, fair (flexion in the horizontal position only) in three and poor (no flexion) in five Failure was due usually to a weakened condition of the muscles transplanted The best results were obtained in cases in which arthrodesis of the shoulder was done also.

Resection and myotomies of the pronators are indicated in pronation contractures. If there is flexion contracture from ischæmic myositis or a

spastic condition the flexor tendons are lengthened The results in twenty-eight cases in which these procedures were carried out either alone or combined were good in seventeen fair in nine and poor in two

Arthrodesis of the wrist is indicated in flail wrist following infantile paralysis in drop wrist from peripheral paralysis in spastic contractures and in flexion ankylosis A wedge of bone is taken out at the articulation between the radius, scaphoid and semilunar through a dorsal incision, and the wrist is brought into dorsal flexion and secured there by sutures passed through drill holes in the bone In the cases of twenty five patients between 6 and 26 years of age this operation was done either alone or combined with other operations mentioned. The results were good in fourteen cases, fair in five poor in four and undetermined in two In the wrist arthrodesis is preferable to tendon transplantation

The best results followed the combined procedures, especially the combination of shoulder arthrodesis with flexor transposition

WILLIAM A CLARK M D

Meyerding H W Hæmorrhagic Cyst of the Upper Femur Periosteal Sarcoma Involving the Right Knee Joint. *Surg Clin N Am* 1921 1 1493

In the discussion of two cases of hæmorrhagic cyst of the femur it is pointed out that the condition usually appears in persons less than 30 years of age that it is always in the diaphysis that after a slow growth the cyst appears to move upward that it is most common in the proximal end of the shaft that and that limp deformity and fracture often occur The cyst may be single or multilocular The periosteum may bulge out, but this benign growth does not burst its bounds and invade as does a malignant growth The operative treatment consists in curetting the cavity and turning a part of the cortex into the space The operation is followed by immobilization in a plaster cast. It is to be regretted that in the past this condition has been confused with malignancy

In the case of periosteal sarcoma involving the right knee which is reported in this article tuberculosis as well as sarcoma was considered a possibility before operation. Eighteen years before examination the knee had been injured and during the succeeding years there was occasional stiffness or soreness. Following influenza in 1919 the knee became greatly swollen. The leg was amputated at the thigh and treatment with the X ray radium and Coley's serum was given The prognosis was poor, not more than 4 per cent of persons with this condition live longer than three years. Death is usually caused by metastasis to the lungs.

H. T JONES, M.D

Todd, T W, and McCally W C: Defects of the Patellar Border *Ann Surg* 1921 lxxiv 775.

The recent war directed the authors attention to numerous cases of swelling and tenderness of the knee joint in which there was no history of trauma and the condition was not due to ordinary activities The swelling was not great but the resultant stiffness rendered the soldier unfit for service Continued examination led to the conclusion that these cases were due to some anomaly of the patella

Emargination of the patella was described by Kempson in 1902 as a common variation in which there is a depression in the upper portion of the outer margin of the bone Salmond in 1919 came to the conclusion that a fissure at the external superior angle in the neighborhood of the vastus lateralis insertion is not uncommon.

In this article are presented a number of cases illustrating patellar anomalies found in adults, such as fissures lipping and exuberant bone growth Examinations of infant patellæ were made to account for them Not more than one ossification center was found in any patella. The patellæ of twenty three full term fœtuses were investigated These showed an area corresponding to the typical site of emargination in which the cartilage was lighter than the surrounding cartilage and on the surface was definitely demarcated from the rest of the cartilage The conclusions reached are as follows

A marked defect in the upper and outer portion of the patella is to be found in 3 per cent of human beings.

This area differs from the rest of the patella even in the cartilaginous state In the adult the development of lipping is exceedingly slow at this point

The area is related to the insertion of the vastus lateralis tendon.

Deep pitting may occur on the surface of the patella

No callus formation indicating fracture is to be found.

No history of trauma is given in cases of patellar defect

These so-called fissured fractures are merely variations of the condition known as patellar emargination and are not due to trauma

JOHN MITCHELL, M.D

Bizarro A. H.: On the Traumatology of the Sesamoid Structures. *Ann Surg* 1921 lxxiv 783

Before discussing the traumatic pathology of the sesamoids, the author reports some preparatory anatomical research based on X ray findings

In the great toe it is the inner sesamoid which is most frequently fractured and as in direct fractures of the patella the most common cause is hyperextension of the muscles. Other causes as summarized by Speed are (1) direct violence due to the fall of a heavy object on the foot (2) the squeezing of the great toe between heavy masses (3) falls from

a height on the foot and (4) a sudden increase in weight bearing force

The diagnosis depends upon the degree of separation of the fragments, the unilaterality and the irregularity of the line of division, pain persistent swelling tenderness, and a comparison of the X ray findings in both feet Crepitus is rarely noted

The treatment is operative and non operative Rest and plaster fixation followed later by massage are the best measures A metatarsal bar in the sole of the shoe is essential

The operative treatment consists in removal of the fractured bone Some surgeons remove the bone only when troublesome symptoms persist

Cases of luxation of the great toe sesamoid have been reported in the literature

Occasionally supernumerary bones of the foot may be the cause of swelling and pain either with or without a history of trauma

In the hand fracture occurs most frequently in the metacarpophalangeal sesamoids of the thumb Unlike the toe sesamoids both of the thumb sesamoid often appear fractured

Trigger finger is due to injury of the fibrous sesamoids of the interphalangeal joints In some cases it improves after a course of physiotherapy

DANIEL H LEVENTHAL M D

FRACTURES AND DISLOCATIONS

Henderson M S The Status of the Bone Graft in the Treatment of Fractures *J Lancet* 9 h 6

The bone graft may be used in cases of recent fracture but is rarely necessary In delayed union and non union it offers the most certain method of treating a difficult group of cases successfully The inlay graft or the massive graft is to be preferred to the intramedullary method since the former brings into apposition a larger area of bone forming element The rôle of the periosteum in bone formation is still debatable but to trust to it alone in the treatment of fractures is to court failure As the hard cortical bone has *little regenerative power* the endosteal layer in which the osteoblasts abound

to expose the endosteal layer and a large graft is placed with its endosteal layer in contact with that of the fragments and held in place by beef bone screws penetrating to the opposite cortex. In order to prevent refracture during the period of absorption the graft should be large enough to increase the diameter of the bone by about 50 per cent It is probable that in most cases the graft itself is absorbed, at least partly and replaced by the growth of new bone from the fragments For this reason adequate postoperative fixation is necessary for a considerable period of time

A group of cases is reported to illustrate the type of operation in various regions of the body and to show some of the difficulties encountered. In a few cases metal plates were used especially in the femur in order to shorten the time of operation In others beef bone plates were applied These do not have to be removed J I MITCHELL M D

Corlette C. E.: A Simple Operative Method of Reducing Obstinate Malposition in Colles Fracture and in Supracondylar Fractures of the Humerus *M J J Australia* 19 II, 397

The author has devised a very satisfactory method of reduction for certain cases of Colles fractures and transverse supracondylar fractures of the humerus

After the fracture has been X rayed in two planes at right angles to each other one or two small incisions are made over the distal fragment, a small sharp hook is introduced so that the points engage the edge of the distal fragment and with the aid of traction in the proper direction the impaction is broken up and the fracture reduced The case is

J W POWERS, M D

Schurmeier H. L. The Mechanics of Fractures at the Wrist *J Am M Ass* 1921 lxxvi, 1119.

The Colles type of fracture is caused by a fall upon the outstretched arm with the hand in extension, slightly abducted and dorsiflexed

As the carpal and metacarpal bones are joined together very firmly the wrist moves in extension and flexion as one bone. A fall upon the wrist causes

the radius is fractured by the avulsive force of the radiocarpal ligament The sudden impingement of the carpal bones against the articular surface of the radius and the splitting of the lower fragment by descent of the lower end of the upper fragment must also be considered

Seventy five per cent of chauffeurs fractures are intra-articular This fact the author attributes to the mechanics of the fracture. The hand is held rigidly parallel with the arm in abduction, exhibiting no dorsal flexion The lines of stress are through a point to the ulnar side of the thenar eminence and the force of the blow is transmitted by the scaphoid which presents a wedge-shaped edge to the radius

JOHN MITCHELL, M D

Galloway H. P H. Treatment of Fracture of the Neck of the Femur *Surg Gynec & Obst* 1921 xxxiii 692

Fractures of the neck of the femur are divided into several groups. The first are those occurring in persons of advanced age, poor general physical condition and low resistance In such cases the saving

of life is paramount and the treatment of the fracture is secondary The second group are those occurring in persons who recover rapidly from the first shock of the accident and whose physical condition permits treatment of the fracture This group includes most cases of impacted fracture and also epiphyseal separation and fracture of the neck of the femur occurring in early life The same general line of treatment is employed in all

It is the author's opinion that Whitman's abduction treatment will give a larger percentage of good results than any other method. The patient is placed on a Hawley table or similar apparatus, and while the surgeon raises and presses upon the trochanter so as to guide it to its normal position, sufficiently strong manual traction is exerted by assistants to equalize the length of the limbs When both limbs are of equal length the affected limb is rotated inward and then both limbs are abducted simultaneously to the extreme limit and a plaster spica is applied from the nipples to the toe with the knee slightly flexed and the foot at right angles A window may be cut over the abdomen and also over the knee to permit daily passive movements of the patella Following the removal of the cast at the end of three months massage passive movements and functional muscle training are given In the cases of adults direct weight bearing should not be permitted until after six months. The progress of repair can be judged by the findings of repeated X ray examinations the extent of passive manipulation and the return of voluntary muscle control. In most cases it is advisable for the patient to wear a caliper splint for several months

For moderately impacted fractures with little shortening and moderate outward rotation a caliper splint or merely a stout stick may be employed after a short period of confinement to bed Massage should be given during the entire course of treatment The more severe cases of impaction should be treated by the abduction method

Removal of the plaster after five or six weeks is followed by massage and gentle manipulation Shortly afterward the patient is permitted to leave his bed on crutches There will then be very little discomfort and only a slight amount of shortening On weight bearing the trochantar tends to travel outward and rests upon the upper portion of the rim of the acetabulum In the author's opinion this procedure is much more simple and gives a better functional result than freshening of the fractured surfaces or bone grafting

RUDOLPH S REICH M D

Ruth C E. Fractures of the Femoral Neck and Trochanters A Rational Treatment *J Am M Ass* 1921 lxxvii 1811

In fractures of the head and neck of the femur the iliopsoas muscle normally an internal rotator be *comes an external rotator and thus is the greatest* factor tending to displacement and non union

Successful treatment of hip fractures depends upon reduction and maintenance of the reduction until the callus is hardened sufficiently to withstand the normal muscle pull

The capsular ligament because of its anatomical relation to the hip joint serves to help in reducing the fractured neck and in maintaining the reduction The blood supply to the neck of the femur is derived from two sources arteries supply the trochanters and distal part of the neck, while the proximal end of the neck is supplied by way of the ligamentum teres.

All successful methods of treating fractures of the neck depend upon the use of the capsular ligament as a splint To obtain this tension of the capsule the author uses traction in two directions i.e heavy longitudinal and lighter outward, upward and forward traction A piece of fiber or binder's board 4 or 5 in wide long enough to encircle the thigh two-thirds and curved to fit its inner surface is well padded with cotton A 4 in strip of adhesive plaster

radiant heat massage, gentle passive movements exercises, and a comfortable shoe with sufficient cork elevation to compensate for the shortening should be prescribed The second subgroup consists of the cases of persons in good general physical condition and with sufficient power of resistance to permit operative interference The author suggests the following procedure

The hip joint is exposed by a Kocher incision 8 in in length the capsule is split along the axis of the neck and the base of the neck is divided from the trochanter with a wide osteotome. The head and neck are removed and the trochanter is implanted into the acetabulum with the limb in abduction The incision is closed and a plaster spica applied from the nipples to the toe in the abducted position

over it. Another strip is passed entirely around the thigh over the binder's board The free end is attached to cords running laterally over pulleys for traction

In reduction the operator flexes the knee on the thigh and the thigh on the trunk both to a right angle at the same time increasing the eversion. This frees all soft parts between the fragments *With the* joints flexed the knee is brought to the midline

are then attached Traction is continued for four weeks.

Impacted fractures of the neck become disimpacted without treatment because of the absorption of the roughened bone at the fracture line Impacted

fractures without displacement do not require the breaking up of the impaction

Fractures through the base of the neck are treated in the same way the capsular ligament serving as a splint

Trochanteric fractures vary in their characteristics The dense aponeurotic investment of the gluteals usually prevents wide separation of fragments of the greater trochanter In fractures in which the lesser trochanter is torn off the iliopsoas is carried with it and eversion of the limb results In such cases the Hodgen splint and Balkan frame are of aid

The author concludes with the statement that successful treatment depends upon accurate diagnosis, complete reduction sufficient traction, and daily verification of the position of the fragments by the X ray JOHN MITCHELL, M D

Ridlon, J Final Results of Fracture of the Neck of the Femur without Treatment, or with Worse Than No Treatment *J Am M Ass* 1921 lxxvii 1815

He does not advocate non-treatment but believes that good results are sometimes due fully as much to the natural tendency of fractures to unite as to the treatment they receive

As there is little external callus in intracapsular fractures, weight-bearing must be delayed The abundant callus in fractures of the shaft permits earlier use of the part

The principle of treatment should be the same as

fractures with no more than ¾ in of shortening should be treated with a Thomas hip splint or a plaster cast without disengaging the impaction Patients who cannot be treated by either of these methods should rest in bed for at least four months without treatment and should not bear their full weight on the leg as long as any sensitiveness persists A good result may be expected in more than 90 per cent of the cases in which this regime is followed

No case of hip injury should be treated as a dislocation until dislocation has been proved When a limb is adducted, rotated outward, and short, a fracture of the neck of the femur is to be assumed because following a dislocation, which usually occurs backward and upward the limb is short, rotated inward, and somewhat flexed.

DANIEL H LEVINTHAL, M D

Santoro, E A Case of Pathologic Fracture of the Femur Due to Cancer Metastasis Followed by Consolidation (Su di un caso di frattura patologica del femore da metastasi cancerigna seguita da consolidazione) *Riforma med* 1921 xxxvii, 1119

The patient was a woman, 56 years of age who had been operated upon a short time before for cancer of the left breast The fifteenth day after the operation she began to feel sharp pain in the upper part of the right thigh, and soon thereafter while walking experienced a sudden, violent and acutely sharp pain in the same area which was followed by lack of power to move

Examination by the author four months later led to the diagnosis of a pathologic subtrochanteric

three years later her general condition having become progressively worse

There are numerous causes for pathologic fracture, and the diagnosis is relatively easy The fact that in this case the abnormal fragility of the femur was due to a metastasis from the mammary cancer was shown by the X ray and suggested by the history Osseous metastases are not rare in cases of cancer of the breast being next [illegible]

at the level of the lesser trochanter Evidently it was transverse and a deformed consolidation, a

of spontaneous fractures due to cancer in ten of which consolidation occurred The author believes the latter figure is incorrect as he has been able to find the report of only one such case that published by Freeman

probability it would have shown an osteoplastic carcinoma as it is only in cases of this type of tumor that consolidation is possible W A BRINGAN

DISEASES OF THE BONES, JOINTS, MUSCLES TENDONS, ETC.

Gluck, T Osteoplasty (Ueber Osteoplastik) *Arch f klin Chir* 1921 cxvi, 13

which, observed for decades, are astonishing He calls attention to the fact that the heteroplasty originated by him has acquired a varied and successful application and has become an indispensable

adjunct of plastic surgery Although the fate of the autotransplanted bone has not been determined definitely and it is not known whether the bone substance periosteum, and marrow remain alive the value of osteoplasty is acknowledged

The main feature of the author s osteoplasty whether living or dead bone or a foreign body is used, is the conducting, supporting and splinting action of the transplant around which the new bone forms. At the same time, the transplant causes powerful stimulation to bone formation. Foreign bodies of organic or metallic nature may serve temporarily or permanently for fixation. A fact of practical importance is that the substituting prosthesis functions before the substitution has ended and before it has begun. The matrix possessing the power of proliferation is stimulated to specific activity by the functional stimulation and in the course of time produces the normal formation. To a certain extent surgery gives nature the building stones and the plan and nature, with surprising perfection fulfills the surgeon s intention.

VOLLHARDT (Z)

Mamourian, M : On the Bone Graft *Brit M J* 1921 ii 934.

opinion the action of the graft is biochemical The graft supplies the stimulating irritant and new bone is formed by the diaphyseal ends, the periosteum the remains of bone in the shaft zone and in the young by epiphyseal lengthening Mamourian

has been exaggerated In most instances the postoperative treatment of a grafted limb includes immobilization This causes atrophy of the recipient bones Can it be claimed also to cause growth of the graft? Macewen s classical result is explained not by the growth of the graft but by the growth of the bone fragments adherent to the membrane lining the tract

Osteoblastic and osteoclastic forces must be equal to insure the formation of new bone in proportion to the absorption of the graft If absorption proceeds at a more rapid rate fracture of the graft is apt to occur Callus appearing at the site of a fractured graft has been thought conclusive evidence of the survival of the graft. The author believes that it is only the result of a greater local stimulus.

A change in the character of the transplanted bone *is also questioned. The fact that after* an Albee graft to the spine only cancellous bone may be found

dense bone of the tibia is replaced entirely by cancellous bone from the vertebræ Unless the graft is thus replaced so that it is indistinguishable after six months necrobiosis is present Infection is not thought to be a serious obstacle to successful bone grafting According to Wheeler a bone graft has inherent bacteria resisting properties This the author interprets to mean that the graft is a poor culture medium and the cellular activity of the graft bed inhibits the septic process. That infection stimulates osteogenesis is proved by the formation of involucrum in osteomyelitis and the ankylosis of infected joints. An involucrum is not formed in tuberculous bone lesions or in bone tumors which are osteo-depressant. The author believes that the new bone and cellular life following the transplantation of a graft is capable of overcoming pyogenic or tuberculous bone infections and may revive normal osteogenesis in bone destroyed by tumors of low malignancy

Four cases are reported with roentgenograms made before and at intervals after operation

J I MITCHELL, M D

Bradford E. H.: The Treatment of Caries of the Hip Joint and Some Observations upon the Use of a Traction Abduction Splint *Surg Gynec & Obst* 1921 xxxii, 700

ly be
s are
does

not furnish adequate fixation or prevent upward hip-bone crowding by the contracting muscles

Bradford has obtained satisfactory results with his abducting extension splint even in advanced cases The splint should not be applied until the flexion and adduction deformity is corrected It can be used as an ambulatory splint, preferably with crutches and can be applied at night. The continued weaning of the splint is indicated as long as muscular spasm is present As spasm subsides the traction should be reduced

For the treatment of desperate cases in which the acetabulum is seriously involved the author advocates the forcible dislocation of the head of the femur from the acetabulum through a posterior incision The deformity can be corrected after the disease has subsided The article is illustrated by eleven cuts JOHN W POWERS M D

Moorhead, J J : Knee-Joint Injuries. *Surg Clin N Am.*, 1921 i, 1597

Joint injury may be intra or extra articular and may involve the bony structure or the soft parts The knee joint with its numerous bursæ, its many pouches, and its large area of synovial membrane offers an opportunity for skillful diagnostic acumen

Contusions or contusion sprains are the most common injuries of the knee joint. Next in the order of their frequency come synovitis, bursitis, loose bodies, tears of the crucial ligament fractures of the patella and the margins of the femur or tibia fractures of the tibial spine and dislocations of the joint

Because of th prominence and contour of their inner margins
injury There
the knee joint
and five on the inner side. Of these, the prepatellar bursa is the most important surgically The crucial ligaments, anterior and posterior serve to give stability to the joint. The anterior is the most important surgically It is attached to the de-

the
the

flexion

The semilunar cartilages serve as shock absorbers and also deepen the pockets on top of the tibia The internal semilunar is semicircular The external semilunar is almost circular The attachments of the external semilunar are much more secure than those of the internal

The internal crucial ligament is more liable to injury than the external because it is weaker longer

external margin of the patella, at about its center Enough oxygen is introduced to distend the joint slowly and completely Radiograms are made in four directions from before backward and the reverse and from within outward and the reverse

synovitis is treated in the same way but massage is used to aid the recovery of the atrophied muscles about the joint. Synovitis from infection such as tuberculosis or syphilis is not included in this treatment.

Purulent synovitis is treated by repeated aspiration and the injection of ether Incisions at the borders of the patella, or splitting of the patella according to the severity of the condition In desperate cases the joint is irrigated every two hours

often produced by trauma incurred with the leg extended, internally rotated, and abducted. Displacement of the tibia forward on the femur makes a diagnosis of ruptured anterior crucial ligament reasonably certain.

The treatment is non-operative or operative Non-operative treatment consists of aspiration of the bloody fluid and posterior splinting for three to six weeks The purpose of operative treatment is to

knee joint with fixation of the foot or leg is the primary cause The symptoms depend upon the severity of the injury

When localized tenderness is apparent over the cartilage the possibility of injury must be kept in mind In cartilage injury local tenderness and limitation of full extension are signs of importance. In crucial ligament injuries rotation and forward and backward motion of the knee joint are increased In cases of mild injuries the treatment is non-operative Fixation of the joint until tenderness

A vertical 3 in incision is made directly upon the injured cartilage The knee is best explored in the right-angle position. A hook is introduced and fractured or dislocated cartilage is withdrawn

in most cases

osteo-arthritis, Charcot's joint some neuropathies, and osteochondritis The symptoms are pain, synovitis, weakness, and slipping or locking followed by re-effusion The X ray may fail to reveal the condition unless oxygen is injected into the joint. The treatment is operative. JOHN MITCHELL, M D

Bérard, L.: The Treatment of Vicious Ankylosis of the Knee Due to Tuberculous Tumor in the Adult (Traitement des ankyloses vicieuses du genou consécutive à la tumeur blanche chez l'adulte) *Rev. de chir.*, Par. 1921 xl, 503.

In an experience of twenty five years Bérard never saw a case of tuberculosis of the knee with a fungoid osseous and synovial lesion and with or without suppuration which was cured by conservative methods if the patient was older than 18 years He does not wish to say that resection should be done in

every case of proved tuberculosis of the knee in the adult, but believes it is indicated when, after a fair trial of conservative methods for four to six months, there is no definite improvement and the patient has almost reached his full growth. The technique recommended is very similar to that of Ollier

Bérard like the majority of French surgeons performs the resection without the previous application of an Esmarch band. Hæmostasis is effected following the section of the vessels, and the wound is closed without drainage. The limb is immobilized in a plaster cast for forty five days, and for two months longer a plastic canvas protective cover is worn, the patient during this time walking with the aid of crutches.

Eight cases of vicious ankylosis of the knee due to tuberculosis have been treated by Bérard during the past ten years. The patients were all more than 17 cases were nd of sixty ing almost immediately At the end of the fourth month he was fitted with bar extending t was worn for a heeled shoe was worn at the end of the sixth month. Two of the patients are now working at farming In no case has there been any lesion necessitating further operation, and with the exception of two cases which were operated upon ten months ago the cures date from one to nine years. The amount of shortening the age of developed limb In three cases there were more or less quiescent tuberculous lesions in the synovia and the bony extremities of the joint at the time of operation and therefore the ankylosis was not complete. In the five other cases complete ankylosis had been established for several years.

In cases of incomplete ankylosis the method of resection should be the same as that used in cases of tuberculous tumor in the process of evolution. In cases of old and solid ankylosis a cuneiform and trapezoid osteotomy should be done without effort to seek the articular space If the resection is too economical a second operation will be necessary because of the retraction of the soft parts.

W A Brennan

Weatherbe, P Cases of Infected Knee Joint Treated by Incision, Drainage, and Movement. *Lancet* 1921 cci 1271

When a diagnosis of septic knee joint is made, treatment should be begun at the earliest possible moment. This should consist of free opening of the joint by lateral incisions, 4 to 6 in. long, on either side of the patella followed by thorough irrigation, the breaking down of all adhesions, manipulation by full flexion and extension, the introduction of several rubber drainage tubes, the application of wet boric lint covered with oiled silk, and the establishment of continuous drainage of the joint by capillary action The dressing should be changed once a day with removal of the tubes and irrigation full flexion and extension of the joint

This treatment should be repeated daily until the wounds are healed. Failure will occur if any of the details are not observed that is, if the incisions are not large enough if the joint is not fully flexed each day or if the dressings are not kept wet or are discontinued before the wound has thoroughly healed The changing of dressings and the movement of the joint are comparatively painless This method of treating septic knee joints apparently gives the best prognosis as regards both life and function

J I Mitchell, M.D

Ober F R.: Immobilization Treatment of Septic Knee Joints. *J Orthop Surg.*, 1921 n. s. iii 689

This article is based on about 100 war cases. Although mobilization treatment is ideal, it has its limitations it must be begun very early the joint must be capable of active function and the care of the case must be entrusted to only well trained nurses or orderlies It is therefore necessary in some instances to fall back on the immobilization method

In the cases reviewed the knees were immobilized on Thomas splints at an angle of about 160 degrees this amount of flexion giving greater comfort than complete extension. Traction was applied to the leg and suspension secured in a Balkan frame or bed cradle. Dressings were done without bandaging Passive motion was avoided because it was always followed by a rise in the temperature. Irrigation was abandoned because it always caused a relapse. Carrel Dakin treatment was tried but this method also was given up as it did not hasten progress. Cases dressed every day did not progress so well as those dressed less frequently Operations were reduced to the minimum as synovial membrane is usually able to take care of itself if given a chance frequent operations under anæsthesia reduce the patient's resistance and often all that is necessary is a simple incision at the most prominent or dependent part of the pus pocket and the insertion of a tube.

The article is concluded with the following summary

1 Mobilization will not always replace immobilization as there are many cases in which mobilization is contra indicated.

2 Careful attention to minor details in the adjustment of the splint and in bed nursing increases the patient's comfort and resistance.

3 A bent Thomas splint is more comfortable than a straight one and more easily managed.

4. Slackness and carelessness will always be followed by disaster

5 Surgical interference should be gentle and precise

6 Passive manipulation irrigation at the time of dressing and frequent changing of dressings tend to prolong the septic condition.

William A. Clark, M.D

Orr, T. G.: A Technique for Leg Amputation. *Ann. Surg.* 1921, lxxiv, 633.

The author offers a technique of amputation devised to eliminate tender scars, ulcers and sensitive neuromata.

Long anterior and short posterior flaps are made. The resulting scar is thus posterior and free from attachment to the bone. The deep fascia is included in the anterior flap.

The posterior flap is quite short and is dissected free only a short distance from the cut end of the bone. The muscles are divided 2 or 3 cm. below the tibial end. The fibula is cut 1 cm. shorter than the tibia. The periosteum is removed 0.5 cm. above the cut ends and the marrow scooped out. Sharp bone edges are smoothed with a rasp. The nerves are freed, drawn out as far as possible, and injected with absolute alcohol. The nerve is then divided just below the injected area.

The entire muscle mass is grouped by means of a chromic purse-string over the anterior beveled portion of the tibia. Muscle flaps are not made. The posterior fascial flap is sutured over the stump. The anterior fascial flap is then drawn backward and sutured so that two layers of fascia cover the stump. The skin is closed and a small drain placed beneath the flaps.

JOHN MITCHELL, M.D.

Nosil, W. P.: The Treatment of Neglected Cases of Club-Foot. *Brit. Med. J.*, 1921, ii, 1109.

Talipes equinovarus, a most frequent deformity following infantile paralysis, is characterized by shortening, atrophy, coldness, and bluish discoloration of the affected limb. The heel is raised with the foot inverted and adducted. There is prominence

[illegible] may cause inward rotation of the lower leg. The treatment is as follows:

The tense plantar fascia and inferior and internal

[illegible] The adjacent surfaces of the calcaneocuboid joint are then removed. Sections of the mediotarsal joint are cut away in order to overcome the varus deformity and the wounds are closed. In some cases it may be necessary to transplant a strong tibialis anticus to the dorsal surface of the cuboid to make it an inverter of the foot. The tendo achillis is lengthened by a Z-shaped incision and the foot held

[illegible] back of the heel. The foot in front of the mediotarsal joint is dropped downward. The first stage of the corrective operation consists in opening the mediotarsal joint on either side of the foot and removing from the tarsus a wedge-shaped piece of bone with its base upward. An additional varus deformity is corrected by removing a broader external

[illegible] astragalus. The foot is then held in an over-corrected position by means of a plaster cast. Removal of the cast in six weeks is followed by massage and, if necessary, the use of braces with a T strap.

Talipes plantaris is bilateral and may be caused by the wearing of short shoes or by neuritis affecting the extensor muscles of the foot following some infectious fever of childhood. The treatment is the same as that for talipes equinovarus. The author has found that after the operation the affected limb grows more quickly than the sound one.

R. S. RUSCH, M.D.

Soule, R. E.: The Value of Bone-Pin Arthrodesis in the Treatment of Flat Foot. *J. Am. M. Ass.* 1921, lxxvii, 1871.

The author calls attention to his operation for the pronated relaxed flat foot. This condition comprises from 70 to 80 per cent of all cases of flat-foot and is the most difficult to cure permanently. Over half of the cases are of congenital origin.

The foot and leg having been prepared and a [illegible] to insure a [illegible] joint is ex[illegible] to 2 in. long on the dorsum of the foot along the course of the anterior tibial tendon. The astragaloscaphoid

[illegible] preservation of the normal curved-surface contact when the forefoot is restored to the desired relation to the leg. At the distal end of the skin incision the medial projection of the scaphoid is exposed. The

bones The drill is then disengaged from the motor and left in place while the bone pin is removed from the antero-internal surface of the tibia and shaped to fit the drilled hole The foot is again securely held in position while the drill is removed and the bone pin substituted

at the end of four weeks, active and passive movements are instituted Light weight bearing is begun the sixth week and after the eighth week full weight bearing is allowed with caution to avoid over fatigue of the foot and leg Massage and active and passive exercise are continued to hasten the restoration of muscle tone

The cases the author reports include ten treated in 1915 (ages 7 to 36 years), nine cases treated in 1916 (ages 6½ to 56 years) two cases treated in 1917 (ages 9 and 35 years respectively) one case treated in 1919 (age 28 years) three cases treated in 1920 (ages 12 to 35 years) and four cases treated in 1921 (ages 12 to 45 years) In all thirty-eight feet were operated upon

The bone-pin arthrodesis was done to relieve (1) the disability due to congenital pronated painful foot (2) relapsing rigid flat foot (3) osteo-arthritis of the feet with pronation (4) rheumatic arthritis of the feet with pronation (5) valgus foot deformity due to infantile paralysis or some other acquired permanent paralytic valgus deformity (6) pronated feet of mentally defective patients and (7) fracture of the midtarsal bones with pain.

F W Carruthers M D

SURGERY OF THE SPINAL COLUMN AND CORD

sten) *Norsk Mag f Lægevidensk* 1921 lxxiii, 491

In a woman 39 years of age there developed in the course of one and one half years the symptoms of a tumor of the spinal cord the situation of which *according to the best neurological authority was* at the level of the sixth dorsal vertebra November 24, 1920 a laminectomy from the fourth to the eighth dorsal vertebra was performed but with a negative result *The patient left the hospital three weeks* later At first there was improvement but this did not continue

January 7 1921 the patient re-entered the hospital *The site of the tumor was then believed to be*

any subjective difficulties The roentgen picture showed a considerable accumulation of air on the upper surface of the brain but not in the ventricles *A picture of the upper part of the column showed* no air in the spinal canal. After eight hours there was sudden severe pain at the level of the vertebra prominens radiating to the upper portion of the breast and the head, *chiefly on the left side.* These attacks came on at intervals of a few minutes and lasted from three to four hours. January 12 a laminectomy of the sixth and seventh cervical and first dorsal vertebræ was done The operation revealed a bluish red soft tumor 1½ by 3½ cm. in size on the anterior side toward the left corresponding to the neurological findings. This was extirpated. the growth to be a dive and subjective ation.

This case presented difficulties with regard to the segmental diagnosis over a long period. *Between* the operations however the symptoms developed so quickly that in the second examination the segmental diagnosis could be made with fair certainty *The intraspinal injection of air was very helpful* This method of examination has not been used before in cases of cord tumors

The injection of air into the spinal column was *first performed by Dandy of Baltimore in order to* force air into the ventricles and subdural space The author has used the method in ten cases of various diseases of the central nervous system. The *technique employed is as follows*

Local anesthesia is induced and the patient placed generally in the sitting position but occasionally in the reclining position with the head 20 to *30 degrees higher than the pelvis. From 6 to 10* c. cm by 3 desir *toms appear that make it desirable to stop* The needle is l impulsion to escape. *is greater than the amount of air introduced* The examination must be performed slowly and with care Usually it consumes about half an hour On an average, 70 c cm. of fluid are withdrawn and 47 c. cm of air are injected

On the basis of symptoms caused by the insufflation the author divides his cases into four groups

Group 1 four cases in which there were changes of hydrocephalic nature but no subjective symptoms.

Group 2 two cases in which there was pain associated with cerebral symptoms, humming in the ears, headache and bursting pressure in the head.

Group 3 a case of cerebral lues and a case of epilepsy In the first case there were radiating

pathologically narrowed canal the air in its ascent causes radiating pain by exerting pressure in the narrow parts

Group 4 a case in which pain developed after several hours and then remained constant at the level of the vertebra prominens where a tumor was found From here it radiated to the thorax After the attacks there was headache These symptoms can be caused only by the injection of air they are due to the passage of the air through a narrow area in the subdural space

These cases show that the intraspinal injection of air may be valuable as an aid to the diagnosis of narrowing of the spinal canal, especially that due to tumors of the spinal cord KOPPITZSCH (Z)

Elsberg, C A : The Diagnosis and Surgical Treatment of Tumors in Front of the Spinal Cord *Surg Gynec & Obst* 1921 xxxiii, 610

Tumors growing on the anterior surface of the spinal cord—whether they are extradural or intradural—give rise to symptoms which are often difficult to differentiate from those of intramedullary growths For this reason surgical interference is often delayed until marked cord symptoms have appeared In order to expose and remove anterior tumors the surgeon must draw the cord over to one side after he has performed the laminectomy and incised the dura Even when the manipulations are carried out with gentleness and care the danger of injury to the delicate cord tissue is very great

About 10 per cent of extramedullary spinal tumors are anterior and anterolateral to the spinal cord

The author describes his technique in the removal of these tumors and emphasizes the fact that when an anterior tumor is extradural the transdural approach will endanger the cord less than the extradural approach FREDERICK CHAMBERLAIN, M D

Neuhof H : A Large Cervical Cord Tumor with Slight Sensory Manifestations: Laminectomy and Radical Excision of the Tumor "Cure" Not Complete Two Years After the Operation. *Surg Clin N Am* 1921 i 1699

spinal cord tumor To exclude the latter operation

was advised Exploratory laminectomy in cases of advanced spinal cord lesions is as safe as an exploratory laparotomy in a parallel intra-abdominal condition It is of little use to remove a spinal cord tumor in an advanced case when the patient is exhausted and debilitated

tense When it was opened there was a gush of

in its removal He believes that any surgeon who recognizes this necessity and the fact that any

and sixth so as to be able to see the cord beneath and to the right of the tumor

As the tumor was found to be extramedullary it was then possible to draw out both of its poles without damage It was not stripped out from beneath the capsule because of the tendency to recurrence when this is done. The pedicle of the tumor attached to the cord and veins was cut after ligation of the veins with fine silk To control the bleeding in the tortuous mass of veins a bit of muscle from the margin of the wound was held in place over the oozing area with the gloved finger immediate hemostasis resulted. The cord was found to be flattened and pushed forward and to the right. The dura was closed with fine silk, and the other layers with catgut A posterior molded plaster-of Paris splint to support the head and neck was then applied

The tumor measured about 9 by 2 by 2 5 cm and proved to be an endothelioma with cystic and hemorrhagic degeneration

The postoperative convalescence was uneventful There was no change in the reflexes of the lower extremities, nor was catheterization necessary

years after the operation the patient is able to do only light work. MARCUS H HOBART M D

Neuhof H. : A Small Extramedullary Tumor at the First Dorsal Segment: Vague Localizing Signs: Advanced Paraplegia: Previous Operation at Another Level: Laminectomy and Removal of the Tumor: Course Uninfluenced by Operation. *Surg Clin N Am* 1921 i, 1705

The patient was a man 62 years of age who for five years, had had weakness and stiffness of the legs and spasticity extending up the entire torso

For two years he had had difficulty in urination and constipation, and occasional incontinence of the bowels Following a mid-dorsal laminectomy done two years before a flattened cord was found and a diagnosis of lateral sclerosis was made.

At frequent intervals agonizing contractions of the muscles of the back, chest or lower extremities occurred Disturbances of sensation developed, but were irregular and although a cord tumor was diagnosed its location could not be determined for three months. At the end of that time an ill-defined belt of hyperalgesia referable to the third or fourth dorsal segment and a strip of diminished sensation in the right forearm and hand (first dorsal segment) were made out.

A laminectomy was done at the second and third dorsal vertebræ but only so-called varicose veins of the cord were found. The author does not believe that these cause trouble unless there is definite compression of the cord A first dorsal laminectomy was therefore done but not until the seventh cervical spinous process was removed was the lower end of the tumor exposed. When part of the sixth posterior arch was removed a dense gray tumor measuring 1 by 1¼ cm. and deeply embedded in the right lateral and anterior surfaces of the cord was seen. As only relief of the symptoms could be hoped for the tumor was shelled ou
away fron
pressure.
in. The wound was closed in layers Microscopic examination showed the tumor to be a psammoma There was no improvement following the operation, and death occurred six weeks later apparently as the result of pyelonephritis.

Marcus H Hobart M.D

Neuhof H.: Endothelioma of the Conus and Cauda Equina: Difficulties in the Diagnosis: Laminectomy and Removal of the Tumor: Rapid Improvement with Return of the Reflexes. *Surg Clin N Am* 1921 i, 1687

The author reports a case characterized by almost constant pain in the lower limbs occasional incontinence of urine and fæces loss of power in the legs, more pronounced on the left side spasticity bilateral complete drop-foot, absence of the knee jerks a decrease in the Achilles reflexes a tendency to ankle clonus more marked on the left side and a bilateral Babinski phenomenon

The X ray showed marked spondylitis of the lower dorsal and lumbar vertebræ with well developed osteophytes Neuhof emphasizes the point that the X ray demonstration of the results of arthritis of the vertebral column over an area believed to be the site of a tumor should not quiet the suspicion of a spinal cord tumor At operation in the case reported a tumor was found whose capsule was attached to the roots of the cauda equina. After a difficult dissection it was removed with the exception of a narrow strip of capsule left attached to the roots of the cauda. The patient made an excellent recovery Frederick Christopher, M D

SURGERY OF THE NERVOUS SYSTEM

Ott W O: The Treatment of Sciatica. *Minnesota Med* 1921 iv 718

The author discusses the treatment of sciatica by the removal of foci of infection and epidural injections of saline solution containing novocaine. His study included thirty four cases treated at the Mayo Clinic since 1918 In the greater number of cases the condition is probably the result of an infectious process involving either the roots or the ganglia Hypersensitiveness of the roots outside of the dura or of the ganglia was indicated by the fact that during the injection into the epidural space pain always occurred down the sciatic distribution on the affected side, but never on the well side This pain was apparently due to pressure exerted by the fluid on the roots or ganglia as it was shown by laminectomy following the injection of methylene-blue into the epidural space of a fresh cadaver that the colored fluid came into contact only with the roots and the ganglia and did not pass beyond

Of the thirty four patients whose cases are reviewed, nine (27 per cent) were completely and permanently relieved fourteen (40 per cent) were partially relieved, and eleven (33 per cent) apparently received no benefit whatever Thirty-one patients obtained temporary relief for two to four teen days.

In some of the cases in which the condition was relieved foci of infection were demonstrated and removed while in others no foci were demonstrated or removed

Tees, F J: The Treatment of Peripheral Nerve Injuries. *Surg Gynec & Obst* 1921 xxxiii, 641

The author states that he has an increasing belief in the ability of a damaged nerve to restore itself if given the opportunity The importance of pre operative care is emphasized viz massage and electrical treatment of paralyzed muscles to prevent degenerative changes, mobilization of joints fixed or apt to become fixed and careful splinting to prevent the paralyzed muscles from becoming stretched by the constant pull of their antagonists.

Of a large number of war injuries to nerves observed by Tees only one in four was referred for operation. The great majority, including some which at first suggested complete interruption, recovered without interference. In the cases operated upon fascial wraps were not used and as far as possible the suture line was left in its natural site an intermuscular or subcutaneous plane

absence of the latter however does not necessarily indicate resection and suture The interstitial neuroma presents a special problem, and the de cision as to section must be based on the conditions of the particular case

In the treatment of nerve injuries the dictum of Tinel that a good suture is far better than a poor liberation should be borne in mind.

FREDERICK CHRISTOPHER, M.D

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL DISORDERS

Sherk, H H : Epidermoid Cysts. *Surg Gynec & Obst* 1921 xxxiii 494

of the epiderm They are differentiated from sebaceous cysts by the absence of an opening and the character of their contents The pearly luster of their contents is one of their most noteworthy and constant characteristics They contain no microorganisms The absence of sebaceous cells and, almost invariably of fats can generally be demonstrated by osmic acid stains Their contents do not

and also unlike the latter cannot be changed in shape JOHN D ELLIS, M D

unna : *Ergebn d Chir u Orthop* 1921 xiv 6 7

There are two stages of wound shock In the first consciousness is maintained but speech is weak and husky Commands are correctly understood, even though they are not always obeyed The sensibility of the skin is diminished and protective motions are carried out tardily The peripheral pulse is small but tense The blood pressure

by death resulting from increasing cardiac weakness or by slow recovery

The stage of collapse as compared with the first stage shows the signs of relaxation of the vascular system The blood pressure sinks. The sensory apparatus remains clear Both stages of wound shock vary considerably in their duration and severity For this reason the first stage is frequently overlooked In the final stage the entire pathologic picture is that of a severe vascular crisis.

The author reviews the historical development of the various theories regarding wound shock. Experimental studies on animals cannot explain this condition correctly as the external factors cannot be reproduced The condition called "operative shock" is more like collapse We can speak of operative shock only when a factor equivalent to an intensive trauma such as high division of the sciatic nerve which exerts a powerful centripetal reflex effect, has played an important part The danger of amputation of the thigh can be considerably diminished by blocking the sensory path by spinal analgesia

The effect of cold upon the pleura may cause operative shock The greater frequency of wound shock in the recent war as compared with former wars was due mainly to the larger ammunition used In addition to the gross action of force, other factors also are effective such as the effect upon the ear the labyrinth, and the brain changes in the air pressure, and the effect upon the psyche.

The author discusses in detail the processes occurring in the body during wound shock and its symptoms. He again emphasizes the fact that uncomplicated wound shock is essentially a vascular crisis produced through the sensory centripetal nerves and passing to the sympathetic system or even to the spinal cord through the sympathetic fibers The clinical symptoms are explainable as a purely vasomotor syndrome The period of relaxation is preceded by a more or less pronounced period

by paralysis of the vasomotors or there may be marked lowering of their tonus and as a result a fall in
pulse
dyspnœ
most severe cases is pathognomonic of wound shock. Local wound shock, occurring only in individual parts of the body as a result of local concussion of the peripheral nerves, is an intermediate state and sometimes a state of transition to general wound shock. The collapse of wound shock is due to the vasomotor relaxation Severe wound shock sets in immediately after the injury and is very often fatal.

There is no free interval between the injury and the symptoms

The differential diagnosis between hæmorrhage and collapse fatty embolism, tissue embolism, autotoxæmia air embolism infection, drug intoxication concussion of the brain, syncope and wound shock are discussed When wound shock leads to death slowly the moment at which the vital functions cease can be determined only with difficulty If the shock is followed by recovery, it is preceded by a stage of erethrism.

There is no prophylaxis. Rest is the main requisite in the treatment. Fresh air, and if necessary the artificial administration of oxygen are of considerable therapeutic value. The application of heat is a life-saving measure. Rapid equalising of the distribution of the blood by lowering the head and the upper parts of the body has a good effect The overloading of the heart by subcutaneous or intravenous infusion of physiological salt solution is not without danger A better effect is obtained by means of repeated smaller intravenous infusions of 200 to 300 c. cm. of 0 9 per cent salt solution containing 30 drops of digipuratum and 20 drops of adrenalin at a temperature of 44 degrees. Pituitrin has a more lasting effect than adrenalin. In drug therapy excitants are contra indicated during the stage of stimulation. If the vasomotor paralysis is pronounced remedies stimulating the heart, especially strychnin, camphorated oil, caffein, and alcohol are indicated No remedy should be used which will cause restlessness of a life without it In general operation is done only after collapse has passed off Chloroform should not be employed for the induction of anæsthesia. Wieting recommends lumbar analgesia and, if necessary the use of ethyl chloride.

VON LOBMEYER (Z)

SERA, VACCINES, AND FERMENTS

Rosenow E. C : The Treatment of Poliomyelitis with Immune Horse Serum *Minnesota Med* 1921 iv 588.

The author reports the results of various physicians who treated in all 128 patients with poliomyelitis with his immune horse serum chiefly during July August and September of 1918 and 1919

There was a history of exposure in eleven cases. In ten instances there was more than one case in a nine cases, infected and enlarged tonsils in thirty seven, excessive adenoid tissue in twenty two, and enlarged cervical glands in twenty four

Intravenous injections of the serum were given in eighty-eight cases Intramuscular injections in thirty eight intravenous and intramuscular injections in twelve, and intraspinal and intramuscular injections in three The total number of intravenous injections was 117, and the total number of intramuscular injections, 103 A spinal puncture was done in all cases preliminary to injection

GROUP I Patients with no paralysis at the time of serum treatment None of the twenty three pa

effect of the serum evidenced by lessening of the temperature the pulse rate and the stiffness and rigidity of the muscles of the neck and back and by drowsiness The average duration of the disease at the time of the first injection was 1 5 days the average cell count in twelve cases was 105 the average age 5 years the average total amount of serum 22 c cm and the average amount of spinal fluid withdrawn 9 c cm

GROUP
of serum
seven pati
tients recovered except one. Twenty five showed beneficial results of the serum at once while in two cases in which the serum was given the third and fifth days of the disease, it appeared to have no effect The average duration of the disease at the time of the first injection was 2 5 days the average cell count in seventeen cases 69 the average age 6 7 years the

late results in twelve cases are not known. Early
Doubtful or
nineteen The
e time of first
injection was 6 3 days the average cell count in thirty nine cases 113 the average age 8 4 years, the average dosage 37 c.cm., and the average amount of spinal fluid withdrawn 37 c.cm

Of the six patients who died one received the first dose of serum on the third day three on the fourth day one on the sixth day and one on the ninth day Respiratory involvement was already present at the time of the first injection in four cases, complete paralysis of the extremities in one and almost complete paralysis in one The amount of serum varied from 5 to 130 c.cm

The average time of treatment in the cases of patients who recovered was 4 6 days after the onset of symptoms, while in the cases of those who died it was ten days.

The mortality in the entire group was 4 7 per cent. Twenty patients showed residual paralysis ninety-one had early benefit from the serum twenty-one showed no good effect The average duration of the disease at the time treatment was instituted was 4 6 days the average cell count 102 the average age 7 4 years and the average total

one was delirious, but both recovered without paralysis.

The earlier the serum treatment was given the more prompt was the recovery. The outcome in the cases treated with serum with regard to the saving of life and restoration of muscle function is better than in those not so treated. Of seventy-two patients not treated nineteen (25 per cent) died of respiratory paralysis, and fourteen had varying degrees of paralysis. W. H. Stewart, M.D.

BLOOD

Martens, M. The Ligation of Veins in Thrombophlebitic Pyæmia. (Ueber Venenunterbindungen bei thrombophlebitischer Pyaemie.) *Arch. f. klin. Chir.*, 9, ci, 1, 720.

At the 1921 Congress of Surgeons the author brought up the still disputed question of ligation

occasionally inflammation of the tonsils, the portal

the extremities.

The frequency of thrombophlebitic pyæmia has been markedly decreased by greater care with regard to antisepsis and earlier operation in cases of furuncle of the lip, appendicitis, cholecystitis, etc., and by more skilful treatment of accidental wounds. The prognosis of pyæmia is poor.

Treatment with drugs (antipyretics, preparations of silver, antistreptococcus serum, etc.) is quite useless. Ligation of the vein, on the other hand, improves the prognosis.

In discussing the history of ligation of veins the author states that Zeufal, in 1880, was the first to perform the operation in thrombosis of the trans-

antrum and opening of the sinus. Four of the patients died of previously existing meningitis, metastases in the lungs or brain abscess. Heine has reported thirty-six cures in ninety sinus cases in six the vein was ligated. Claus obtained a cure by operation in thirty of fifty-three sinus cases. Of

in cases not treated by ligation the cures average only 50 per cent.

Martens does not operate in thrombosis of the cavernous sinus. In pyæmia secondary to chole-

On the other hand, Sprengel, Martens, and Bruett operated without success. Trendelenburg in 1908 cured a case of puerperal pyæmia by ligating the hypogastric and ovarian veins, and another case in 1911 by ligating the vena cava and ovarian veins. The operation has since been performed frequently. Venus in 1911 collected 115 cases in which the mortality was 66 per cent. Veit succeeded in six cases out of twenty. Latko in ten out of twenty-eight, and Brumm in five.

The author, using the extraperitoneal method, has operated in eleven cases and cured seven. In two cases he ligated the vena cava and in the others one or both ovarian and hypogastric veins or the common iliac. In one case the left hypogastric and ovarian veins were ligated as thrombi were palpable in the left parametrium. The rigors, however, continued and there was pain in the right parametrium. Following ligation of the common iliac and ovarian veins three days later the rigors ceased and the temperature fell.

Early operation is necessary. In one case the author was unable to reach the end of the thrombus in the vena cava after four days. If the common iliac vein is ligated, it is wise to ligate the external iliac vein at the same time to guard against retrogressive continuance of the thrombus formation.

the angular vein in furuncle of the lip, and of the saphenous vein in suppurated varicose veins, etc.

treatment, amputation wounds in infectious processes should be left open, and the most careful asepsis should be observed in obstetrics and at operation. When pyæmia has become established, ligation of a vein or veins is imperative and should be done early. Soubbotitch (Z).

Unger, L. J.: The Deleterious Effect of Sodium Citrate Employed in Blood Transfusion. *J. Am. M. Ass.*, 1931, lxxvii, 107.

Biologic tests demonstrate that the transfusion of unmodified blood is of far greater value than the transfusion of blood modified by the addition of sodium citrate.

Sodium citrate even in the low percentage employed in a citrate transfusion affects the red blood cells making them more fragile The value of such blood to a patient suffering from a hemolytic disease such as pernicious anæmia is lessened to that extent

Sodium citrate diminishes the available quantity of complement in two ways by its direct action on the complement itself and by introducing into the plasma an anticomplementary substance which inactivates complement This substance is derived directly from red blood cells.

Sodium citrate also reduces almost to nil the function of opsonins and practically destroys the phagocytic power of the white blood cells. The phagocytic index of the blood of various donors varies. Since complement and the phagocytic power are of prime importance in the protective action against pathogenic organisms, unmodified blood from a donor with a high phagocytic index should be employed when an attempt is made to combat local or general infections by means of transfusions

In the selection of a donor therefore attention should be paid to the finer qualitative differences in the blood SAMUEL KAHN M D

GENERAL BACTERIAL INFECTIONS

Hektoen L.: Old and New Knowledge of Immunity *J Am M Ass* 1921 lxxvi, 1935

The history of immunology may be divided into the premicrobic period ending about 1880 and the microbic or modern period, from 1880 down to the present day To the premicrobic period belong the attempts to produce immunity to the bites of venomous snakes by early savage peoples, King Mithridate's legendary method of producing a universal antidote for poisons, early Chinese and Turkish methods of actively immunising against smallpox, Sydenham's conception of specific remedies for all important diseases Thomas Fuller's early statements as to the specificity of the immunity character

[illegible] development of nosography in the early part of the nineteenth century

The microbic or modern period began with the demonstration by Pasteur that specific immunity

[illegible] of immunity are now recognized (1) the antitoxic, and (2) the antimicrobic. It has been found that immune reactions are not limited to infectious agents and their products but may be set up by a variety of protein substances. Such proteins are termed antigens. An individual once thoroughly influenced by the entrance of an antigen into his body becomes changed and this change may manifest itself by (1) the persistence of an excess of free antibodies in the blood (2) an increased rate of antibody formation on re-entrance of the same antigen, (3) anaphylactic reactions on re-introduction of the antigen or (4) an atypical course of a re-infection Antigen antibody reactions may play a part in the production of certain non infectious diseases or syndromes such as hay fever and serum disease

The author reviews the development of our pres-

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Deaver J B.: Old Methods Versus New in Surgical Diagnosis. *Surg Gynec & Obst* 1921 xxxii 605

In assuming the office of President of the Clinical Congress of the American College of Surgeons Deaver sounded a warning against the acceptance of new methods and new remedies unless they can stand the acid test of experience. The radium treatment for cancer has fallen far short of being a universal cure and indeed in many situations where help is most needed it has proved sadly lacking

He stated further that there seems to be a danger of under-estimating the value of the old and tried methods of clinical diagnosis by sight touch and hearing and of regarding the findings so acquired as less scientific than those obtained through the medium of a piece of apparatus or a reaction in a test tube All data must be submitted to interpretation before

rectly i

examin[illegible] as those secured by indirect methods.

We must therefore see to it that while the boundaries of knowledge are being extended and while we are placing new tools in the hands of the younger generation the older arts which are the chief reliance of the diagnostician receive proper emphasis

H A. MCKNIGHT M D

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Naffaigas, J C.: Experimental Studies on Hydrocephalus. *Bull Johns Hopkins Hosp* 1921 xxxii, 381

[illegible] siderably higher than that of normal kittens, the average difference being 50 mm of cerebrospinal fluid

The intravenous injection of a strongly hypertonic solution of sodium chloride into hydrocephalic animals produced a brief initial rise in the pressure of the intraventricular cerebrospinal fluid which was followed immediately by a marked depression. The

decrease in pressure at times produced negative values This phenomenon is probably to be explained by the apparently rapid absorption of the cerebrospinal fluid from the dilated cerebral ventricles

[illegible] injection of hypotonic solution through the ventricular walls

Intraventricular absorption of cerebrospinal fluid occurred in the hydrocephalic kittens the pathway of escape was through the ependyma into the underlying capillary network The absorption was hastened by the intravenous administration of strongly hypertonic solutions

The absorption of the cerebrospinal fluid was similarly found to occur through the ventricular ependyma in normal kittens The pathway of escape was the same as in the hydrocephalic kittens the process was very slow in the normal animal but was hastened by the administration of hypertonic solutions The physiological significance of this intraventricular absorption in the normal animal is probably slight

The choroid plexus took absolutely no part in the intraventricular absorption of the cerebrospinal fluid

H A McKNIGHT M D

Mann F C A Technique for Making a Biliary Fistula *J Lab & Clin Med* 0 n, 84

gall bladder (3) excising the common duct at the point of entrance to the duodenum with a piece of duodenal wall and suturing it to the skin and (4) placing a cannula in the common bile duct These procedures, however are not satisfactory because the blood supply to the transplanted part is insufficient or because of infection of the viscus

The essentials of technique described by the author are definite fixation of the common duct in a superficial position and drainage of the duct to the exterior A midline or right rectus incision is made and carried far forward as possible without [illegible] the point of entrance of the common duct into the duodenum and between the duodenal wall and the pancreas Through these openings the peritoneum and then the fascia are sutured with double No 2 chromic catgut This procedure leaves the duct bearing portion of the duodenum just under the skin The superficial fascia and skin are then sutured over the transposed loop of intestine Care must be taken not to cause obstruction by suturing too close to the ends of the loop

After complete healing (seven to fourteen days) a small incision is made over the transposed loop of intestine at the point where the common duct is located, and the duct is exposed, ligated, and opened so that it will drain at its point of emergence from the skin A soft rubber catheter is kept in the duct for a day or two after the operation Observa[illegible]

liver the secretory pressure of the organ, or the movements of the gall bladder

Mann has made observations over a period of six months during which time the animals maintained an apparently normal condition However as bile seems to be essential to life, the condition of all animals with biliary fistulæ sooner or later becomes serious Occasional catheterization of the duct will prevent cicatrization CLAYTON F ANDREWS, M D

ROENTGENOLOGY AND RADIUM THERAPY

Sofland, A : Radiation in the Treatment of Leukemia. *J Radiol* 1921 II, 5

After reviewing the different measures introduced and used in the past decade in the treatment of [illegible] the standpoint of symptoms. From the standpoint of cure no permanent foundation on which definite claims may be based has been established to date Frequently an enlarged spleen may be reduced to normal in a short time, and in some cases of the Hodgkin type, glands of enormous size may be reduced with almost unbelievable rapidity by radiotherapy Unfortunately the test of time has shown that these immediate results are neither permanent nor curative. In spite of subsequent radiation, there is a gradual enlargement of the affected organs and glands and eventually there will come a time when radiation fails to prevent a fatal termination

The technique varies necessarily with the symptoms of the particular case. The aim should be to diminish the pathologic activity of an accentuated leucocyte count as rapidly as possible In doing this, however it is of the utmost importance to watch the behavior of the red blood corpuscles and the hemoglobin Radiation may be easily carried [illegible] effects. The author frequently employs radium over the spleen and roentgen radiation over the osseous structures and glandular fields It is of the

utmost importance to radiate the inguinal and axillary regions thoroughly whether or not any palpable gland chains are present. The methods of applying the radium and roentgen rays are described in detail. The course of the treatment is determined in large measure by frequent blood examinations.

An important phase of the subject is the possible correlation between lymphatic leukemia and adenosarcoma. In some of these conditions the blood picture may be so atypical as to challenge the best diagnostic skill. A condition diagnosed at the outset as typical Hodgkin's disease may develop rapidly into a condition bearing every clinical resemblance to a sarcoma of high malignancy. Age seems to have considerable bearing on the

tain a retarding influence on the progress of the disease. ADOLPH HARTUNG, M. D.

Van Allen, H. W.: A Retrospective Note Covering the Treatment of Tonsillitis by the X Ray. *J. Radiol.* 1921, ii, 18.

In an attempt to ascertain the permanency of the beneficial results obtainable by roentgen treatment of enlarged tonsils, the author checked up about fifty cases which he treated three or more years ago for cervical adenitis following repeated attacks of tonsillitis with chronic enlargement. The results of this investigation showed the beneficial effect upon the tonsils very definitely. About 80 per cent of the patients had had no further attacks of tonsillitis and the tonsils had ceased to annoy, having been greatly reduced in size. In the rest of the cases there had been only acute inflammations after the radiations.

By chance the method of treatment corresponds quite closely to that recommended by Witherbee. It was always fractional, but the dose varied. Probably in those early days when methods of exact measurement were not known it was much less than is given today. As instruments of precision came into use an 8-in. spark gap a 3 mm. aluminum filter 3½ ma. of current a 16-in. distance and twenty minutes of time were employed, and the treatment was repeated once a week for about six weeks.

From this study of his cases the author concludes that the percentage of permanent cures was greater in the early days than later when more active treatment was given. None of his patients developed telangiectasis or skin atrophy, but he has noted these conditions in patients who received more vigorous radiation. ADOLPH HARTUNG, M.D.

Bowing, H. H.: The Value of Radium and X Ray Therapy in Hodgkin's Disease. *J. Radiol.* 1921, ii, 20.

were noted in practically all cases.

The etiology of Hodgkin's disease is unknown. By some authorities focal infection is believed to be a factor. The disease is characterized pathologically by enlargement of all the lymphoid tissues of the body. In the majority of cases the primary lesion is in the cervical glands on one side and spreads to the opposite side with extension

finally to

abdomen

tion of large endothelioid cells, numerous multinu clear giant cells, progressive fibrosis and an abund ance of eosinophile cells.

The clinical course of the disease is either acute or chronic. The acute condition is rapidly progressive and terminates fatally in a few months. The chronic condition may last two to five years or longer.

In the differential diagnosis lymphosarcoma, tuberculous adenitis and pseudoleukemia must be considered.

Radium treatment as used at the Mayo Clinic consists in the application of from 5,000 to 6,000 mg. hrs. of radium to each right and left cervical and supraclavicular area, from 2,000 to 3,000 to the infraclavicular and inguinal regions, and from 1,000 to 3,000 to the axillary areas. Severe reactions are treated by catharsis and the administration of sodium bicarbonate. Two to four areas measuring 2 by 4 cm. are usually radiated at one time with an interval of two to three days between the treatments.

The present formula for X ray treatments at the Mayo Clinic is a broad-focus Coolidge tube, a 23 7 cm. parallel spark gap, skin target, 30 5 cm. distance, time twelve minutes, 5 ma. of current, filtration by 6 mm. of aluminum and a piece of sole leather. The different gland areas, the mediastinum and the abdomen are exposed successively. The treatments are repeated every three weeks until six or eight have

the beginning or end of radium exposures.

The initial good results of radium and X ray treatment may be due to direct destructive effects on the glandular elements. The large glandular en

Ra

patient should be increased by intensive radium treatment of the superficial glandular enlargements

may entirely disappear. L. H. FOWLER, M. D.

Quick, D.: Radium in the Treatment of Epithelioma of the Lip. *J. Radiol.* 1921, ii, 1.

The possibilities for radium therapy and diagnosis are probably greater in cases of epidermoid carci

noma attacks the lip only by extension from the skin

has raised indurated edges, metastasizes early and is more malignant than Type I

The author quotes statistics regarding the operative results and states as a conclusion that 70 per cent of clinical cures for the five-year period is a fair average His discussion of the surgical procedure brings out the disadvantage of scarring and tissue loss when block dissection of the neck is done Block

Latter expectant treatment is advised operation should be delayed until the appearance of glands Before rupture of the capsule and infiltration of the surrounding tissues the glands are protective and should be dealt with intelligently The plan used at the Memorial Institute is given as follows

The primary lesion is treated with radium only From 60 to 65 mc -hrs of emanation are applied per square centimeter of surface, screened with 0 5 mm of silver at a distance of 4 mm from the lesion for even distribution of the rays The radium is applied on three sides of the lesion and held in a cast of the lip and lesion made previously The tubes are embedded in the molding compound cast by gouging groves with a hot gouge after the cast has been fitted The tubes are held in place by pouring melted paraffin over them after placing them in the groves All lesions are thus treated and usually one treatment is sufficient In cases of deep infiltration, emanation is used also One millicurie of emanation gives 132 mc hrs before decay The emanation is inserted interstitially by means of a special trocar

lessened

The neck is always irradiated in favorable cases with radium and in the others with either radium or the X ray or both The object is to stimulate the protective forces in the lymphatics and to destroy

nodes are fully destroyed by radiation alone Surgery is contra indicated unless definite cancer nodules are felt Nodes other than cancer nodes are protective and a barrier to further dissemination Block dissection is destructive to protection and even stimulates the growth unless every node is removed

If not treated nodes ar

burying of emanation along the involved chains of lymphatics at the time of operation. The wound heals before the reaction from the radium sets in. If the capsule of the node is broken and infiltration has occurred the emanation is buried at the time of the incision without dissection of the mass. Local anæsthesia is advised

The author gives his own statistics based on 162 cases The total number of patients traced is 115

clinically free from the disease, the average time being eighteen months Six died and one is steadily getting worse In ninety two cases the condition was primary and no nodes were found Sixty seven (72 8 per cent) are clinically well Nine later developed nodes and had a block dissection. Eight of these are clinically well, one died two months after operation and three died of intercurrent disease but at the time of death were free from malignancy

A. J Lartigau M.D

Pfahler G E.: Radium Combined with X Ray Treatment of Carcinoma of the Breast. *Am. J Roentgenol* 1921 n s viii, 661

The treatment of carcinoma of the breast by radiation is in principle the same as that of malignant disease elsewhere in the body Successful results

length of time and with sufficient intensity

For the past six years Pfahler has recommended an ante-operative course of X-ray treatment including the breast, the axilla, and the supraclavicular region and carrying as much radiation as possible into the tissues within a period of one or two weeks The object of this is to so devitalize the malignant cells that they cannot easily reproduce themselves either in the wound or in other locations if transplanted by the lymph or blood channels during the operation. This treatment should be followed by an

after the preliminary treatment a subsequent period

and there is metastasis, more radiation must be given over a longer period of time and the outlook is less hopeful.

Pfahler uses the following technique At least three areas are treated (1) the mammary region,

(2) the supraclavicular region and (3) the scapular and posterior axillary region The radiation is done with a Coolidge tube, a 6-mm. glass or aluminum filter, a 9-in parallel spark gap and 5 ma. of current. When the focal skin distance is 30 cm the time is twenty minutes and when the focal skin distance is 40 cm. the time is thirty five minutes. Each of the three areas is covered in this manner twice within a period of two weeks. The longer technique is preferred but seems to increase the radiation sickness. Therefore the shorter technique is frequently chosen. By means of two applications within a period of two weeks an amount which in one application would cause a serious erythema may be given safely

In the treatment of primary carcinoma of the breast by radiation alone the preliminary X ray dosage technique is the same as in the ante-operative radiation already described At the end of two weeks, radium needles (10 mgm. each) are inserted throughout the palpable lesions 0 5 cm. apart if they are to remain eight hours and 2 cm. apart if they are to remain sixteen hours In order that no part may recover or develop a resistance to the rays while some other part is being treated, the needles must be inserted under aseptic conditions and into every portion of the neoplasm either in a single application or in more than one application within a period of one week.

After a detailed account of six cases Pfahler summarizes his conclusions as follows

Radiologists should study carcinoma of the breast and its treatment with the same thoroughness as the surgeon.

The best procedure for the treatment of primary carcinoma of the breast will probably consist of ante-operative X ray treatment followed promptly by operation and again promptly by postoperative X ray treatment

For inoperable primary carcinoma of the breast treatment by X ray and radium offers a reasonable hope of success if it is skillfully and thoroughly given The earlier it is applied the better will be the result.

Recurrent and metastatic carcinoma from carcinoma of the breast can frequently be made to disappear completely by skillful X ray or radium therapy but probably better by a combination of both and success can be hoped for providing the disease is localized to the area treated.

All patients should be kept under observation and requested to report for examination at increasing intervals for an indefinite time.

D R. Bowen M.D

LEGAL MEDICINE

A Childbirth Case—Error in Referring to Pus. *Schnetzky vs Zanle* (Ill 1915) *182 N W R.* p. 751

March 5 1919 while attending the defendant the plaintiff was employed to take care of the defendant's wife who was delivered of a child the same evening On March 9 he detected symptoms of pneumonia in the wife, and on March 10 began a course of treatment for this condition which he continued until March 13 During this time he did not treat the patient for any other ailment On March 13 the plaintiff was discharged and a Dr Berwick was called

When the plaintiff sued the defendant for the medical services which he had rendered the defendant and his wife, the defendant counterclaimed for damages on account of the plaintiff's negligence in treating his wife. Dr Berwick testified that at his first visit he found the defendant's wife suffering from septicemia with a very high temperature that the source of such trouble was in the uterus that the condition of the uterus was such that it was dangerous to attempt to clean it out that on March 13 the patient did not have pneumonia and there were no indications that she had recently been so afflicted that four days afterward the witness flushed and cleared out the uterus that in the strongly odorous fluid discharge he found a portion of the placenta about the size of a pigeon's egg and that the critical condition in which he found the patient was the direct and probable result of the failure to remove such portion of the placenta

Dr Berwick also testified that at the time of the discharge from the uterus there was no pus, and there was no pus and a temperature that rose from 104 to 106 degrees F during the period of five to seventeen days after the birth Moreover the presence of pus was made a part of the hypothetic questions by the defendant's counsel in his examination of all the medical experts save one

The plaintiff testified that he examined the after birth and found it intact. He was corroborated on both of these points by the midwife in attendance, and on the first by the defendant The trial resulted in a verdict and judgment for the defendant. This judgment was reversed and the cause remanded for a new trial because, although Dr Berwick testified directly that there was no pus in the discharge in which he claimed he found a portion of the placenta, it was quite apparent that, through a mistake which could easily arise in the trial of such a lawsuit the court and counsel on both sides had assumed that witnesses.

A consideration of the entire testimony satisfied the supreme court that the reiterated inclusion of and emphasis on the presence of pus in the discharge must have influenced the jury in a substantial degree in arriving at the verdict it rendered.

J A. Castagnino

Pregnancy Diagnosed as Tumor After Ovariotomy
Gutschall v Geiger (U) 231 S W R p 87

a surgical operation When the abdomen was opened it was found that pregnancy and not a tumor was the cause of trouble

One of the matters in dispute was whether the defendant was negligent in assuming that the plaintiff was not pregnant since although about nine months previously he had removed her ovaries, he

only that the defendant made a mistake in diagnosing

that a surgeon of ordinary care and prudence would not have advised or undertaken it

If conditions were such as to lead a surgeon of ordinary care and skill to think that the plaintiff was not pregnant or even that as a remote possibility she might be and yet an operation was necessary and the defendant in the honest exercise of his best judgment thought an operation was proper then the defendant would not be liable, even though it afterward turned out that the defendant was mistaken in diagnosing the plaintiff's condition. If there were conditions such as to raise a question whether an operation was advisable or proper, then the question of whether the defendant's decision to operate was negligent or not should be gathered from the opinions and testimony of those who had special knowledge and were qualified to speak on such matters The mere fact that the plaintiff became pregnant notwithstanding that she had only a small portion of one ovary did not, of itself show that her pregnancy was abnormal, i. e., that abnormal conditions were associated with that pregnancy

The jury returned a verdict in her favor for $3,000 damages but this judgment was reversed and the cause remanded for a new trial on account of error in the admission of the testimony of the plaintiff's

ness in his wife's lawsuit only when the transaction constituting the basis of the action is one "had with or conducted by the husband as her agent.

J A Castagnino

GYNECOLOGY

UTERUS

Culbertson C The Disposition of the Uterus Following Salpingectomy Where It Is Desirable to Preserve Menstruation *Am J Obst & Gynec* 1921 ii 497

The author reviews 518 cases of general pelvic peritonitis involving the tubes which were treated by abdominal section. Both tubes were removed in 445 cases one tube was removed in 52 cases and both tubes were left in the remaining 21 cases In the 445 cases in which both tubes were removed

In such cases there are four possibilities. First, the uterus may be left alone. This is rarely practicable as it is often already displaced either as a result of the disease condition for which the operation was performed or as the result of some other pre-existing factor

The second possibility consists in some method of round-ligament shortening It has long been the author's opinion that this procedure should be reserved for cases in which pregnancy is to take place in the future.

The third possibility consists of ventral fixation. This method is probably the one most generally employed in the surgical clinics of the United States. However it forms a pillar in the lower mid abdomen, renders peritonization difficult or impossible and like the other two methods requires the retention of the entire uterus except the portion of the cervix which may have been dealt with by a plastic operation. It is safe to say that secondary operations for removal of the uterus more often follow ventral fixation than any of the other procedures

The fourth possibility consists in the removal of the entire fundus of the uterus a procedure which leaves a small organ that can be entirely covered by peritonization, that remains in its normal position and is capable of maintaining menstruation to a degree sufficient to satisfy the physiological and psychological requirements, and that is not subject to subsequent excessive bleeding.

In all respects this treatment of the uterus is similar to Bell's acro-hystero-salpingectomy' except in the method of peritonization which requires freeing of the round ligaments. In the author's opinion imbrication of the round ligaments and approximation of the broad ligaments from side to side over the uterus is superior to the method described by Buettner He believes that in order to secure the advantages set forth by Bell and Polak more of the fundus must be removed than is possible unless the round ligaments are freed

If the uterus has been in retroversion and the cervix continues to swing too far forward shortening of the utero-sacral ligaments is carried out as is done in association with round ligament shortening for simple uterine retroversion

While fixation of the uterus into the abdominal wall was used in the early years this procedure has been virtually abandoned in favor of the operation of defundation Patients operated upon as long ago as 1913 are still menstruating There has been little or no dysmenorrhœa complained of and in not one instance has the follow up revealed a premature menopause or a continuance of excessive uterine bleeding On the contrary the menses are scanty in amount and their duration from one to three days. In some cases the problem of leucorrhœa remains, but this will never be overcome as long as the cervix remains E. L. Cornell, M D

Shaw W F: The Present Position of the Treatment of Carcinoma of the Cervix. *Brit M J* 1921 ii, 1101

The importance of the early recognition of carcinoma is generally understood If a careful bi manual examination were made of all women near or past the menopause who have a history of bleeding other than that of normal menstruation many early cases would be found Cases too far advanced for the radical Wertheim hysterectomy have been treated with radium but the author has seen only one so treated in which improvement lasted more than one year When these cases are examined two months after radium treatment the cervix is smooth with scar tissue but recurrence is the rule

In one far advanced case in which examination several months after treatment with radium showed an apparently operable condition, Shaw performed a Wertheim hysterectomy but it was done with great difficulty because of the dense adhesions in which the ureters were embedded At present it is his practice to give a radium application one week before operation, as the tissues do not become sclerosed in that period. In this way the patient has the benefit of both treatments and the difficulties of operation are not increased.

I. E Bishop M D

ADNEXAL AND PERI UTERINE CONDITIONS

Curtis, A. H.: The Bacteriology and Pathology of Fallopian Tubes Removed at Operation *Surg Gynec. & Obst* 1921 xxxii, 631

This article reports the study of fallopian tubes from nearly three hundred patients. One hundred and ninety two were subjected to most painstaking bacteriological and histological examinations.

From the clinical history examination of the external genitalia, evidence obtained at operation, and laboratory study of the tubes, it was found that gonococcal infection was responsible for the pathologic changes in over 70 per cent of the cases Approximately 10 per cent more were thought to have been primarily infected with the gonococcus, but this could not be determined with certainty In somewhat more than 15 per cent the tubal pathology appeared to have been due entirely to other pus-producing bacteria notably various types of streptococci

Tuberculous tubes were found in the absence of generalized tuberculous peritonitis in 5 per cent of the cases

Bacillus coli is particularly common in tubo-ova

tosis for a period of more than ten days or two weeks Therefore it appears that the fallopian tube is not a focus for chronic gonorrhoeal infection Persistently active gonorrhoea of the tubes is evidently ascribable either to recurrence of infection from without or the chronically

types of streptococci yielded pathologic evidence of an active inflammatory process long after the introduction of the bacteria, and streptococci were occasionally isolated many months, or even years, after the acute process had subsided

Gonorrhoeal pelvic infection primarily involves the tubes and results in thickening induration closure of the fimbriated ends and the formation of pelvic adhesions The latter may be separated by blunt dissection Microscopic examination shows

cells

A single attack of gonorrhoeal salpingitis is usually without protracted clinical symptoms or severe pathologic results Greatly thickened tubes are usually due to repeated exposures

Implicit reliance is not to be placed upon hematosalpinx as evidence of tubal gestation as hemorrhage may occur in greatly thickened gonorrhoeal tubes

Salpingitis nodosa, although generally of gonorrhoeal origin, may result from numerous causes, inflammatory or non inflammatory the etiology of a doubtful case is best explained by microscopic examination

In streptococcus infection tubal involvement is usually only a part of the picture Perisalpingitis is the most common type of tubal lesion Even when there is an extensive salpingitis, the fimbriated extremities will probably remain open the mucous

villi and nests of columnar cells in the tube wall differentiation from the gonorrhoeal tube is then difficult

Tuberculosis is very apt to be overlooked if routine histologic preparations are not made When the condition is limited to the pelvic organs it is difficult to establish a diagnosis from the gross appearance alone Unusually resistant adhesions suggest tuberculous or streptococcus infection

Somewhat similar operative measures appear indicated in streptococcus and tuberculous salpingitis In both diseases the infection is usually not confined to the tubes, in both viable bacteria are often still present in the tissues at the time of operation and there is danger of chronic postoperative infection of the ovaries Particularly as regards extirpation of the ovaries, more radical surgery appears indicated than in gonorrhoeal infections of corresponding severity E L Cornell, M D

EXTERNAL GENITALIA

Schroeder R., and Kuhlmann, E. A.: Ulcerations of the Vagina, with a Report of One Case Each of So-Called Round and Varicose Ulcer of the Vagina (Die Ulcerationen der Vagina. Zugleich Mitteilung ueber je einen Fall von sog. Ulcus rotundum und Ulcus varicosum vaginae) *Arch f Gynak* 1911 cxv 145

Ulcers caused by foreign bodies, prolapse, simple necrosis, and gangrene are not considered in this article

Group 1 Round ulcers. The round ulcer has been described in the literature fourteen times. In most cases it was single and its identification was not always positive In the fifteenth case here reported, the ulcer was regarded as one of the group of round ulcers because no specific change could be made out by microscopic examination. It was a not quite circular lesion with a sharp margin situated close behind the posterior commissure Its base about 2 mm deep in the center was some-

the first variety only four cases already described (Vautrin Hammerschlag) are considered here The ulcer is irregular in form and has thickened, hard margins The marked destruction of the tissue of the cervix, portio and vagina and the fatal hemorrhages prove that the lesion is not to be included among the round ulcers. On the contrary it is related to the aphthous ulcer Three cases of the latter (Neumann, Oppenheim) are described. The lesions are irregular smooth grayish-yellow plaques

developing simultaneously in the portio and vagina. Accompanied by a necrotic angina of apthous stomatitis they appear with local red zones and general phenomena of fever after irruption of herpes vesicles and show histologically a necrosing inflammation

GROUP 3 Tuberculous ulcers. The authors have collected fifty-six cases These ulcers are of three types (1) primary (2) secondary without simultaneous disease of the genital organs and (3) secondary with simultaneous disease of the genital organs To Type 1 belongs only the one much disputed case of Friedlaender in which a small tuberculous ulceration was found on the portio vaginalis around the external uterine os, in an otherwise normal woman who had died of apoplexy microscopically this ulceration showed a large number of tubercles with giant cells. To Type 2 belong six cases in which the ulcer was developed by the hæmatogenous and lymphogenous routes or by the transference of saliva from other tuberculous foci The majority of the cases belong to Type 3 and are divided into (1) those with ulcerations only (2) those with ulcerations and tubercles (3) those in which the findings are doubtful Thirty seven cases of uncomplicated ulcerations are described nine cases of ulceration and tubercles and

as follows

The lesion is round oval or polyhedral and varies in size from that of a pinhead to that of a silver dollar or even larger The margins are at first wall like but later jagged with deep indentations and very much undermined. The base is reddened coated over with yellow and formed of gray tubercles or cheesy masses Pain is always present. The ulcers are situated on the vault of the vagina or on the posterior vaginal wall near the portio They may develop at any age Tubercle bacilli must be differentiated from smegma bacilli by animal experimentation Approximately 7 1 per cent of all cases of tuberculosis of the genitalia belong in this group

GROUP 4. Luetic ulcers. Type 1 of this group are the primary ulcers Forty-seven cases are known. In the majority ulcers were found also in the portio and vulva There are two forms the parchment chancre a flat, red or dull brown movable ulcer and the typical hard ulcer The inguinal or pelvic glands are swollen. Type 2 are ulcers showing

dollar The base is deep often segmented and covered with an amyloid coating The lesion bleeds easily but is painless and in pregnant women tends to phagedenic degeneration

GROUP 5 Soft ulcers In 3 4 per cent of the cases the ulcer occurs in the vagina It has a delicate dentated margin slightly undermined and an inflammatory zone Its base is often nodular with an amyloid coating It bleeds easily and is painful In the soft elevated ulcer which is relatively common, the base is elevated and smooth The Ducrey Unna streptobacillus and the inguinal bubo complete the findings

GROUP 6 About eighteen cases belonging to this group have been reported In the majority the lesion was due to infection from the anus Following superficial epithelial necrosis there is eschar formation and then ulcer formation by suppurative degeneration. The process spreads with countless small round ulcers over the entire vagina only small islands of mucous membrane escaping Healing forms flat slate gray scars There i never any atresia of the vagina

GROUP 7 Diphtheric ulcers Though vaginitis is not rare in diphtheria only one case of primary diphtheria of the vaginal membrane has been described On the posterior vaginal wall was a deep-seated ulcer covered with a dark brown membrane Typical diphtheria bacilli were found

GROUP 8 Uræmic ulcers Eichhorst observed the only known case Flat round and elliptical ulcers with sharp margins were found on the anterior and posterior vaginal walls. The tissue adjacent to its margins was transformed into a necrotic greenish gray fatty mass The remaining portions of the vagina were unchanged

GROUP 9 Ulcers due to drugs Hammer reported five cases of ulcer which developed during treatment with mercury The ulcers were both single and multiple. One case of ulcer due to chromic acid corrosion has been described and two cases have been reported in which criminal abortion was the cause of destructive processes involving the deeper tissues. In three cases ulcers appeared after

a case described by Unger as telangiectatic ulcer belongs to this group The authors case was that of a woman in the eighth to the ninth month of pregnancy On the posterior wall of the middle third of the vagina was a segmented irregular ulcer about the size of a half-dollar which was profusely permeated with dark red nodules. The base had a purulent, fatty coating and the margins were raised and slightly infiltrated The surrounding tissue was extremely vascular Examination after excision revealed the absence of any specific characteristic and indicated definitely that this was an area of thrombosis of the vaginal veins, some of which had already undergone connective tissue organization KULLNKAMPFF (Z)

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Gordon O A Jr The Management of Abortion, from a Study of 530 Consecutive Cases. Am J Obst & Gynec 921 II, 5

The treatment of abortion has been primarily conservative Its form depends upon whether the abortion is threatened inevitable or incomplete, aseptic or septic Threatened

[illegible] hypo-
[illegible] sulphate of morphine sulphate in ¼ gr doses As a rule this type of case becomes either an inevitable abortion within twelve or eight een hours or the pregnancy continues normally The inevitable or incomplete case is the type constituting by far the largest number These have been treated in the following manner

Upon admission to the hospital the patient is shaved and the vulva are prepared as for labor No examination is made prior to this preparation A vaginal examination in the lithotomy [illegible] then made with a [illegible]

[illegible] there
[illegible] age If there is considerable bleeding such as occurs in something over [illegible] cent of the cases packing is done All patients with inevitable or incomplete abortion whether they require packing or not are given pituitrin [illegible] cm loses every two hours for four doses The packing is done with the patient in the lithotomy position without anesthesia and und

[illegible] the packing

no packing is removed from vagina in from twelve to twenty four hours, and about 80 per cent of the cases requiring packing [illegible] cent of the products of gestation will be removed from the vagina with it to render another pack unnecessary If marked bleeding recurs, as in less than 20 per cent of the cases, a second packing is applied in the same way as the first A very small percentage of the cases required packing more than twice and in none was packing done more than three times. If the patient continues to bleed following the second and third vaginal packings, as will occur in some thing less than 4 per cent of the cases, curettage may then be indicated

The author has found that as his care in the management of these cases improves, the number requiring interference (and by interference he means any intra-uterine manipulation) grows less. In cases with moderate bleeding continuing over some time there is frequently a retrodisplacement. This is overcome at least temporarily by the use of a retroversion pessary The bleeding then soon ceases All patient

[illegible] day
[illegible] on the day after bleeding ceases, and unless there is some special contra indication they are discharged from the hospital two days later

In none of the septic cases was there any intra uterine manipulation or irrigation Patients with sepsis were placed out of doors and in the Fowler position Their feeding was forced possible

[illegible] and sera. Thus far no special difference has been noted in the ultimate result or in the duration of the illness in the septic cases relative to any special type of extra uterine treatment

The [illegible] conclusions are summarized as follow

[illegible] a
[illegible] d

[illegible]

no mortality and morbidity in abortion cases is in direct ratio to the amount of intra uterine interference The greater the manipulation and interference the higher the mortality and morbidity

4 Curettage in abortion changes many aseptic cases into septic cases.

5 Curettage is therefore seldom indicated and often is actually harmful

6 [illegible] a

[illegible]

L L Connell, M D

LABOR AND ITS COMPLICATIONS

Newell, F R: Abdominal Abortion *Am J Obst & Gynec*, 921 II, 606

By the term "abdominal abortion" is meant the termination of pregnancy before the period of viability by abdominal hysterectomy in preference to pelvic operation

The principal advantages of abdominal hysterectomy are that it can be performed under local [illegible] on patients who are considered poor

risks for general anæsthesia and that, since the contra indication to pregnancy is permanent, the termination of the pregnancy can be supplemented by sterilization The present pregnancy can be ended and future pregnancies made impossible at a single operation with minimal risk

The ordinary indications for abdominal abortion

causing signs of failing compensation early in the present pregnancy, and second cases of chronic nephritis in which the disease is distinctly progressive and the history shows that recent attempts at childbearing have resulted invariably in the birth of stillborn children in spite of adequate medical attention.

Quiescent though not arrested pulmonary tuberculosis in patients who already have children would seem a proper indication both for the termination of the present pregnancy and for sterilization after due consultation with the patient.

Occasionally cases of diabetes which do not yield to ordinary treatment may also offer indications for sterilization in addition to the termination of the pregnancy

The operation is most useful, however, in the case of patients with decompensated cardiac lesions

formed more safely under local anæsthesia

The author has adopted local anæsthesia preceded by the administration of morphine and scopolamine for cæsarean section at full term when the use of a

of the abdominal wall
free infiltration of the abdominal wall with novocaine when the patient's general resistance was below normal, he has been entirely satisfied with the results.

The technique of abdominal abortion under local anæsthesia is described in detail as follows

About two and one-half hours before the time set for operation the patient is given 1/6 gr of morphine and 1/200 gr of scopolamine by hypodermic injection The scopolamine is repeated at forty minute intervals, but usually it is not necessary to repeat the morphine. Three or four doses of scopolamine but occasionally more are necessary to prod
covered
operating
necessary
operating room

The field of operation is prepared quickly with iodine and the site of the incision is anæsthetized with ½% per cent novocaine, care being taken to anæsthetise the skin thoroughly and also the fascia layer

After the proper interval the abdomen is opened in the usual way a low median incision being made just above the symphysis. If the pregnancy is of more than three and one-half months duration the uterus can be easily manipulated through such an incision without great traction on the peritoneum In earlier cases the uterus must be grasped with hooks and drawn up to the wound, at times considerable traction being necessary This may cause some reaction, but as a rule it is not great. The uterus which is practically non sensitive can be opened the ovum removed with the finger and the wound sutured without any marked reaction al

the most satisfactory method is excision of the tubes from the cornua of the uterus. In the author's experience the injection of a syringe full of novocaine into the inner portion of the broad ligament and the cornua of the uterus is advisable before this is done The presence of old abdominal adhesions increases the difficulty of the operation to some extent since peritoneal adhesions are extremely sensitive, but they can be injected with novocaine and then cut and tied if a proper interval is allowed for the action of the novocaine. The manipulations necessary to remove the uterus under local anæsthesia would probably be very painful because of the traction of the peritoneum Therefore this method of sterilization has not been attempted under local anæsthesia In the operation described the uterine incision and the abdominal wall are closed as in any ordinary cæsarean section and the patient then treated as after any other laparotomy

Surgical shock has been absent in most cases and postoperative vomiting has not occurred in any

po
to pregnancy
sidered justifiable There is less shock and less loss of blood than in abortion by the pelvic route, and in addition the recurrence of pregnancy is prevented

E. L. Cornell, M.D

Holland E.: Methods of Performing Cæsarean Section. *J. Obst. & Gynæc. Brit. Emp.*, 1921 xxviii 349.

The results of about 4 000 cæsarean sections performed for various indications during the period from 1911 to 1920 are reported. The total number of cases in which the operation was performed for

and lately these have been coming to the front. In fact at the present time there is much uncertainty regarding cæsarean section The defects of the classical operation as met with in practice are as follows

1 The risk of sepsis in infected or suspected cases. The classical operation is not safe when

infection is suspected or present i e when labor is *advanced and the membranes* are ruptured, and when there have been many vaginal examinations or attempts at delivery by forceps

2 The risk of rupture of the scar in a subsequent pregnancy or labor Quite apart from rupture of the scar which is comparatively rare, the proportion *of thin and defective scars found at subsequent* operations is very high

3 The risk a rare one of intestinal complications during convalescence

4 Adhesions between the uterine scar and intestine omentum or abdominal wall which sometimes cause *much difficulty in subsequent operations*

It is easy enough to perform a classical cesarean section but the greatest care must be taken to suture the uterine wound properly This is the step in the operation which is apt to be done imperfectly There must be no hurry every suture must be inserted and tied deliberately

The best method of suturing is that in which interrupted sutures are passed through the whole thickness of the uterine wall except the decidua An essential point is that they start well outside the edges of the incision so as to include a good thickness of the uterine wall

Closure of the uterine peritoneum is of great importance in preventing the leakage of sepsis from the interior of the uterus to the peritoneal cavity

The author first incises only the peritoneum throughout the length of the proposed incision and then reflects it for half an inch all around The muscle is next incised in the usual way through the length of the bared area In suturing the wound the muscular wall is sutured first the reflection of the peritoneum allows the needle to be inserted well outside the edge of the muscle so that it takes a wide bite After the layer is tied the reflected peritoneal edges can be accurately united first by a running suture and over that by a Lembert suture It is important to wait for complete retraction before inserting the sutures The author considers silkworm gut the best suture material, silk the next best, and catgut most unsuitable

The advantages of the cervical over the classical operation are the following

1 The wound lies in a quiet part of the uterus and is at first during healing There is no tendency for the edges of the wound to be drawn apart or for gaps to form between the sutures For these reasons healing occurs under more favorable circumstances than following the classical operation

2 The incision is made through a less vascular area, and bleeding from the edges is extremely slight

3 The edges of the wound are thin suture is therefore easier and quicker

4 The position of the wound is such that adhesions to the intestines, omentum, or abdominal wall cannot occur there is only a short line of peritoneal suture *at the bottom of the uterovesical* pouch.

5 The operation causes less disturbance of the abdominal contents the intestines are never seen

7 The scar is in a safer area for subsequent pregnancy and labor as the lower uterine segment stretches late in labor

8 The operation is just as easy to a practised surgeon as the classical procedure

It is obvious that a great deal more experience and careful recording are necessary before a sound conclusion can be drawn regarding the relative merits *of the classical and lower segment operations* In the future Holland will employ the transperitoneal lower segment operation for all cases unless the lower segment is [illegible] cavity is also [illegible] kyphosis A the operation only when the patient has been long in labor when it is easier and when infection of the wound is to be feared E L Cornell, M D

Kerr J M M Indications for Cesarean Section. *J Obst & Gynec Brit Emp* 921 xxvm, 338.

In general unless the child is very small, cesarean section should be chosen whenever the conjugata vera is under 3¼ in (8 1 cm) Even when it measures as much as this, the operation may be indicated occasionally When the conjugata vera is 3 4 in one must estimate very carefully the relative size of the head and the pelvis Any other procedure than cesarean section should be employed only if the overlapping is slight and a certain degree of fixation of the head in the brim of the pelvis can be secured

Pubiotomy is relatively seldom a suitable method in cases of contraction at the pelvic rim because the gain in the conjugate is slight for each inch of separation at the symphysis The cases in which it is suitable are those in which the accoucheur has carefully estimated the relative size of the head and the pelvis, has erroneously come to the conclusion that spontaneous delivery will occur has made one or two attempts with the forceps (employing moderate traction) and has failed to deliver Under such circumstances pubiotomy gives excellent results

For contractions at the outlet, pubiotomy is especially suitable because *every inch of separation* of the pubic bones gives a corresponding increase between the tuberosities of the ischia. Cases of pronounced kyphotic or masculine pelvis, in which the head is arrested at the outlet are the most striking examples

The induction of labor does not come into competition with cesarean section as the results of the former are very rarely satisfactory if the conjugata vera is under 3 4 in Induction of labor is indicated in cases in which at a previous parturition the accoucheur experienced difficulty in extracting the child *with the forceps and it is believed that a slightly* smaller child can be delivered easily

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account

In con
nection with this indication the author summarizes in tabular form eighty-eight cases with a maternal mortality of 8 per cent and a fœtal mortality of 19 per cent The high fœtal mortality is accounted for by the fact that in a considerable number of cases the children were premature and in many the tumors interfered with the growth and development of the fœtus. A few of the cases might have been dealt with by myomectomy and vaginal extraction of the child.

Cæsarean section is rarely necessary in cases of

ly be raised out of the pelvis and removed if the patient is placed in the Trendelenburg position and an assistant pushes it up from the vagina if it is impacted in the pelvis. In the very exceptional cases in whicl
section
section
was 10 per cent and the fœtal mortality 8 6 per cent.

In addition to these more common tumors the author's tables include two cases of broad ligament cysts four of malignant ovarian tumors, one of tumor of the bladder ten of tumors of the pelvis, nine of tumors of the pelvic colon and rectum and twenty five of carcinoma of the cervix. Taking all of these cases together the maternal mortality was 17 6 per cent and the fœtal mortality 33 per cent. Practically all of the deaths were those of patients with

Ir
form
per cent. There is no doubt that this would have been lower if the operation had been performed earlier The great difficulty in these cases is the selection of those suitable for this very radical procedure. Everyone who has been engaged in obstetrical practice for any length of time has encountered many most unpromising cases which recovered following ordinary medical and obstetrical

ed in the
placenta prævia as the plugging manual manipulation, version, and delivery of the shoulders and head are associated with much greater danger to the mother and infinitely greater danger to the child. He has employed it in six cases, and in all the mother and child were saved In this particular condition it is of vital importance to operate early

Cæsarean section is indicated only in the severe cases of accidental hæmorrhage

There are fourteen cases of ventrofixed uteri in which cæsarean section was done none of the mothers died but there were two fœtal deaths

In three cases cæsarean section was necessary following the interposition operation

Few obstetricians of experience would advocate cæsarean section for prolapse of the cord

there were two maternal and two fœtal deaths

The tables show eleven cæsarean sections performed because of large size of the child four for large head two for occipitoposterior position two for brow presentation and three for impacted breech presentation—in all twenty two cases None of the

admit them as justifiable indications under special circumstances. The great difficulty is the determination of the degree of dystocia which may be encountered

Rigidity of the cervix and vagina is also placed in the list of indications. Although a few cases are encountered in which cæsarean section is indicated—for example, old cicatrices seriously obstructing the passage—few surgeons advocate the employment of such radical measures for even extreme rigidity of the cervix

Under the h
the life of the
cardiac disease
of 20 per cent two cases of advanced pulmonary tuberculosis, with no deaths four cases of intestinal obstruction with two maternal deaths and one case each of diabetic coma septicæmia and chorea, all of which were fatal.

The author is convinced that twenty years hence the accepted indications for cæsarean section will be extended even beyond the limits suggested

E. L. Cornell, M D

PUERPERIUM AND ITS COMPLICATIONS

Roos, T The Treatment of Puerperal Sepsis (Zur Behandlung der puerperalen septischen Erkrankungen) *Fortschr d Med* 1921 xxxix, 708

treat
thoso
idwife
Institute in Mainz. In view of the severity of the infection, no remedy should be left untried which offers any promise of success whatever The local treatment of puerperal ulcers and septic endometritis

internal genital organs may be injurious The same is true of vaginal and uterine douches which may force septic material into the tubes and even into the peritoneum Douching is frequently followed by a chill and as the result of the breaking through of the wall of granulation formed by the body peritonitis, thrombophlebitis, septic thrombosis or general sepsis may develop

Instrumental cleansing of the septic endometrium and atmocausis, which apparently provide a favorable culture medium for the bacteria in the uterus, have also been abandoned Uterine douches are employed today only when there is pronounced stasis of the lochial secretion with absorption and high fever Removal of ichorous fetal or placental remains with the fingers is followed by a douche forty-eight hours after the disappearance of fever It is best to leave small placental remains untouched during fever as digital or instrumental removal is more dangerous even after a period of weeks

Attempts to improve the condition by operative removal of the infected organ usually fail Frequently peritonitis or septicopyemia results and these as a rule are soon fatal Whether an abdominal or a vaginal hysterectomy is done the entrance of virulent bacteria into the operative wounds, the connective tissue, the peritoneum, and the opened blood vessels can rarely be prevented Surgical treatment is usually restricted to (1) the opening of abscesses of the pelvic connective tissue (2) in

to point They can then be reached much more easily and with less danger either through the vagina or by abdominal incision and heal rapidly without complications Encapsulation is obtained best by rest and the administration of opiates. The application of heat is recommended to aid in the decrease and absorption of encapsulated abscesses.

In the presence of a puerperal peritonitis having its origin in a pelvic peritonitis which as a rule cannot be expected to become cured spontaneously immediate operation is indicated In the beginning

is best made in the midline under local anesthesia. The incision should be only a few centimeters long Secretions should be drained with rubber drains and, if necessary several counter-openings should be made Irrigation with saline solution is contraindicated as it might spread the process further Ether may be poured into the abdominal cavity In especially severe cases only adrenalin-saline solution should be given intravenously Electric light treatment diathermy of the pelvis, etc find a wide application

An experience of many years in the treatment of puerperal sepsis has demonstrated that intravenous injections of the silver colloids and the acridin salts (acriflavine) deserve special consideration. The prophylactic administration of these preparations to enable the body to overcome a spreading infection is also recommended In addition, analeptics cardiac stimulants, alcohol baths and a nourishing fluid diet are indicated Boos (Z)

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Le Fur R. Notes on Various Methods of Kidney Exploration and Their Trustworthiness. *Med Press* 1921 n.s. cxii 528

The author describes more or less in detail the various methods of determining kidney function paying special attention to experimental polyuria

mined in two ways (1) by increasing the quantity of urine (experimental polyuria) and (2) by increasing the concentration of urea (maximum concentration test) It is wise to make both tests. Moreover as the fact that a kidney has the power to excrete the maximum amount of urea is of no value unless the blood urea is normal in amount the blood urea test (azotæmia) is indispensable

Ambard's constant may be worked out to advantage if it is used to corroborate the azotæmia test but the author considers the azotæmia test more reliable

Color tests the elimination of phloridzin sodium chloride etc. are of no more value than the first and second tests mentioned

HORACE BOOTHBY M D

Smith E. C : A Case of Unusual Solitary Tuberculoma of the Kidney *J Urol* 1921 vi, 375

Fev

occur

tic, having a secondary relationship to active or quiescent foci in some other part of the body

The case reported in this article was that of a

plete autopsy showed a large solitary renal tuberculoma and absence of any other focus of tuberculosis in the body

The author draws two conclusions from this case (1) persistent fever unexplained by pulmonary lesions or other usual causes is a contra-indication to immediate operation in renal tuberculosis and (2) closer co-operation between the pathologist and the surgeon will be of benefit to both and especially to the surgeon H W PLAGGEMEYER, M D

Helmholz, H F Modes of Infection in Pyelitis *Am J Dis Child* 1921 xxii 606

Since identical symptoms may be produced by cortical abscess of the kidney and infection of the ureter pelvis or bladder urine examinations are of little value in localising a lesion of the genito-urinary tract No large series of cases of pyelitis has been studied except by means of bladder cultures and this procedure determines simply that the organism obtained came from some point in the genito-urinary tract By means of ureteral catheterization the location of a lesion higher up in the urinary tract may be determined This helps little in the determination of the mode of infection but it demonstrates the numerical incidence of infections of the bladder and kidney

The

s of pyelitis is bacteriological Only instances

in which necropsy is done very soon after death may

The only conclusions of value to be drawn from postmortem examinations of cases of pyelitis are those drawn from instances in which examination was made very shortly after death since it is well known that the mucous membrane of the pelvis is rapidly macerated by the urine The pathologic findings of Thiemich, abscesses of the renal cortex unassociated with lesions of the bladder or pelvis

the pelvis no involvement of the pelvic mucous membrane was found

In cases of renal involvement definitely secondary to lesions of the lower urinary tract there is usually

there is some condition damming the flow of the urine

y the while ids to is the ic dif

ferentiation between hæmatogenous and ascending pyelitis

Regarding the direct passage of organisms from the intestinal canal to the kidney by way of the lymphatics the author states that not sufficient evidence has been brought forward to warrant a discussion at this time In view of the manner in which the lymphatic system develops there is a possibility that in some cases a direct connection persists

C H Jackson Jr M D

Kretschmer H. L.: The Treatment of Pyelitis *Surg Gynec & Obst* 921 xxxiii, 632

This article is based on a study of 200 cases of pyelitis or pyelonephritis Lesions of a surgical nature were excluded These cases may be divided

A careful search was made in every case for the presence of lesions of other organs which might have been factors predisposing to the occurrence of kid

prostate and seminal vesicles was associated with the cure of the pyelitis

Renal infections may occur at any age but are most common in adults, 25.5 per cent occurring between the thirty first and fortieth years of age The author believes it not improbable that many cases of cystitis in infancy and childhood are in reality cases of pyelitis Of the patients whose cases are reviewed 39 per cent were males and 61 per cent were females The bacteriological examination showed colon bacilli in 132 cases, staphylococci in twenty-eight streptococci in one, colon bacilli and staphylococci in ten, and staphylococci and streptococci in one The findings in twenty-seven are not given Both kidneys were infected in ninety nine cases, the right kidney alone in thirty-two and the left kidney alone in seventeen In twenty-one cases the bladder and both kidneys showed pus

Of the 177 cases in which more or less accurate cystoscopic data were obtained 128 showed pathologic changes 75 per cent showed bladder changes

30 5 per cent turbidity of urine in 32 5 per cent blood in the urine usually of moderate degree in 21

has often been mistaken for a number of diseases Stricture of the ureter large hydronephrosis, and renal tumor can be differentiated by the pyelogram. Diligent search for the tubercle bacillus in association with the colon bacillus must be made. Repeated guinea pig inoculations often prevent an incorrect diagnosis

In 44 5 per cent of the cases there was a history of some sort of surgical operation. Such patients fall into the following four groups

Group 1 Those who were operated on because of urinary symptoms, but were not relieved by the operation, the inference being that they were operated on with insufficient study of the case

Group 2 Those who exhibited urinary symptoms for the first time after some surgical procedure. In the presence of insufficient data it is within the bounds of probability that the so-called pyelitis (postoperative) may have been an exacerbation of a

in four there had been a nephrectomy with resulting pyelitis in the remaining kidney in each case

In cases of acute colon bacillus pyelitis instrumental or local treatment was not resorted to the one exception to this rule being the pyelitis or pyelonephritis of pregnancy The treatment of chronic pyelitis may be considered under the following heads vaccine therapy, medical treatment and pelvic lavage Early in this work vaccines were used

monas that the results have been as satisfactory as before Internal treatment consisted of the use of alkalies, acids, and urotropine The routine management was instituted with the administration of one teaspoonful of sodium bicarbonate in water three times a day enough to render the urine distinctly alkaline. Patients unable to take the sodium bicarbonate were given citrate of potash or citrate of soda. *When the urine had become alkaline* 10 gr of urotropine were given three times a d

remains questionable

poses, the pyuria and infection clear up Various drugs have been used for pelvic lavage Kolb has ob-

tained gratifying results with aluminum acetate Mercurochrome has been suggested and the organic silver preparations are in wide favor In the series of cases reported silver nitrate alone was used. The amount of solution employed depended on the individual case but the average amount was from 8 to 10 c. cm of a 0 5 to 2 per cent solution The lavage was usually done twice a week or at five day intervals until the urine was sterile on three successive tests.

As it is a well recognized fact that conditions of the gastro-intestinal tract such as chronic constipation colitis etc. produce lesions of the urinary tract routine examination of the rectum for hæmorrhoids fissures etc. of the prostate and seminal

ing up the renal infection

The author's summary is as follows

1 Pelvic lavage with silver nitrate is an efficient and simple method of treating infections of the renal pelvis

2 In the series of cases reported 66.4 per cent of the patients treated were finally discharged with urine sterile and free from pus.

3 In selecting cases for treatment lesions of the urinary tract which are of a surgical nature must be excluded

4 Lesions of the abdominal viscera which may be factors in contributing to relapses or rendering this treatment inefficient must be recognized and subjected to appropriate treatment

5 Special stress must be laid upon proper attention to lesions of the gastro-intestinal tract

6 Lesions of the male and female genital tract must receive proper treatment

7 Careful routine examinations of the urine in all cases of obscure abdominal pain should be made before the patient is subjected to surgical operation

C D Holmes M.D

Rehn E.: The Causes of Secondary Hæmorrhage Following Nephrotomy and Its Prevention (Ueber die Ursachen der Spaetblutungen nach Nephrotomie und deren Verhuetung) *Beit klin Wchnschr* 1921 lviii, 1217

The fact that severe and even fatal secondary hæmorrhages occur occasionally after nephrotomy induced Rehn to investigate their causes by experiments on animals. He found that the bleeding is due to congestion caused by displacement of the kidney resulting from insufficient operative fixation too early activity after the operation or excessive pressure exerted on the large veins by the over filled pelvis of the kidney whose emptying through the ureter is prevented by blood.

The kidney must be well fixed and the renal pelvis drained into the bladder as well as externally Accurate suturing of the parenchyma is also essential. Since Rehn has paid particular attention to these points no further hæmorrhages have occurred in his cases

von Tappeiner (Z)

Culver H Papilloma of the Ureter *J Urol* 1921 vi, 331

Culver reports a case in which a neoplasm was found 4 cm. from the upper end of the ureter and another small sessile growth about 1 cm. from the first growth The histologic diagnosis was papilloma

The clinical history was that of hæmaturia and colic due to the passage of clots Nephrectomy gave relief from the bleeding for ten days At the time of its recurrence cystoscopic examination showed a large clot protruding from the ureteral orifice The ureter was then dissected out Convalescence was uneventful.

Culver has been able to find only fifteen cases of ureteral papillomata reported in the literature

Irvin S Koll, M D

BLADDER, URETHRA, AND PENIS

Kretschmer H L: Spinal Cord Bladders Occurring in Pernicious Anæmia. *J Urol* 1921 vi 195

The author reports a series of four cases of pernicious anæmia which were studied by him from the urological point of view They all presented the group of bladder symptoms usually associated with spinal cord lesions Kretschmer therefore emphasizes the fact that in addition to the usual causes for spinal cord bladders pernicious anæmia must be borne in mind

The subjective bladder symptoms in the early stages of pernicious anæmia are difficulty in urination suggesting urinary obstruction a feeling of incomplete emptying of the bladder and possibly frequency Later retention or incontinence develops.

In two of the cases studied the cystoscope showed fine trabeculations and in two others, a severe cystitis In three cases the urine obtained from both sides by ureteral catheterization showed infection The colon bacillus was present in all three and in two there were other bacteria

Henry L. Sanford M.D

Hunt, V C Submucous Ulcer of the Bladder and Its Surgical Treatment *Minnesota Med* 1921 iv 703

Until recently ulceration of the bladder was referred to as cystitis secondary to infection elsewhere in the urinary tract and the ulcer was not

Sixty two similar cases have been reported in the literature since then and fifty three of these have been confirmed by operation. The term submucous ulcer is based on the pathology of the lesion.

Regarding the direct passage of organisms from the intestinal canal to the kidney by way of the

G H Jackson Jr M D

Kretschmer H L: The Treatment of Pyelitis. *Surg Gynec & Obst* 921 xxxiii, 632

This article is based on a study of 200 cases of pyelitis or pyelonephritis Lesions of a surgical nature were excluded These cases may be divided

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Group 2 Those who exhibited urinary symptoms for the first time after some surgical procedure. In the presence of insufficient data it is within the bounds of probability that the so-called pyelitis (postoperative) may have been an exacerbation of a latent pyelitis Some of the cases in this series, however were cases of genuine postoperative pyelitis

Group 3 Patients who had been operated upon many years before they came under observation.

Group 4 Patients who had had kidney operations in four there had been a nephrectomy with resulting pyelitis in the remaining kidney in each case.

In cases of acute colon bacillus pyelitis instru

toration pyelitis, the colon bacilli gain entrance through the tears in the hymen

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donate were given citrate of potash or citrate of soda When the urine had become alkaline, 10 gr of urotropine were given three times a day

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a single ureteral catheterization for diagnostic purposes, the pyuria and infection clear up. Various drugs have been used for pelvic lavage Kolb has ob-

urethra or the bladder which can be caught and controlled fairly easily but from the bed of the prostate itself As the true capsule is only fairly resistent it is easy to see that in difficult enucleations it may be torn through and more or less severe hæmorrhages may result from injuries to the plexus of Santorini and the vesical plexus

Three different methods of controlling these hæmorrhages have been suggested (1) packing of the prostatic bed with a gauze tampon (2) continuous irrigation with hot saline or mildly antiseptic solutions (3) the use of mechanical contrivances such as the Hagner or Soresi bag Plain gauze tampons have been tried on account of their simplicity and availability Squier packs the cavity with a strip of gauze which he leads out of the bladder through the drainage tube. Beer attaches a silk string to the packing and carries this out through the drain Freeman employs a strip of iodoform gauze or gauze soaked in some styptic material The pack is held in place by a pair of blunt forceps The handles of the forceps are carried out through the incision and pressure is made on them with the dressings and the bandage This method is open to the objection that the patient is wet and the packing causes a certain amount of pain Continuous irrigation with hot saline or mildly antiseptic solutions has been tried without invariable success. Hagner used a rubber bag in the bed of the prostate which he kept distended with air Soresi uses the same bag distended with mercury The objection to these mechanical contrivances is that they easily get out of order are cumbersome and are not always at hand After all, the best means of controlling hæmorrhage is the simplest and one which does not require special instruments viz. packing with gauze. In order to overcome the tendency of the pack to become wet with urine and therefore to become loose, pressure was tried Deaver and Kammerer were the first to employ sutures of the intravesical wound edges over the tampon.

In Fischer's method the edges of the wound are caught up with a few Allis forceps A strip of iodoform gauze is tightly packed into the cavity until it is filled and the projecting portion of the packing is then cut off If the hæmorrhage is controlled this tampon is removed and used as a pattern for the size of the final tampon which is secured by a stout silk ligature around the center After the insertion of this tampon into the bed of the prostate the wound edges are sutured with strong plain catgut over the tampon so that the prostatic cavity is entirely shut off from the bladder The prevesical space is drained by a small cigarette drain. After three or four days the intravesical sutures become loose and the tampon can be withdrawn by pulling on the silk ligature, the drainage tube being removed at the same time. Fischer claims for this method that it prevents the tampon from becoming soaked loose by the urine, and that it keeps the urine from coming in contact with the fresh wound cavity

C. D Holmes M.D

MISCELLANEOUS

Lowsley O S Morrissey J H., and Ricci J V : The Use of Gum Glucose Solution in Major Urological Surgery *J Urol.*, 1921 vi 381

The authors emphasize the importance of a decrease in the blood pressure as an evidence of developing shock. In forty cases they maintained the blood pressure by the intravenous use of gum-glucose solution In selected cases it was given during operation and in others was given afterward It was introduced into the vein not faster than 25 c.cm per five minutes, according to the body weight The noticeable clinical phenomena following its administration were the maintenance of the blood pressure increased diuresis, increased thirst, the absence of nausea and increased passage of flatus. The solution has no hæmolytic or agglutinative action.

There were no deaths among the patients who were treated in this manner but one of them experienced a severe chill The preparation of the solution is described in detail. H. G Hamer M D

SURGERY OF THE EYE AND EAR

EYE

Sinskey H L. Levin, M B., and Sacks, B.: Episcleritis—A New Method of Approach *Arch Ophth* 1931 v 526

In a case which had been investigated by several other physicians previously the usual possible causes having been completely eliminated, the effects of eight different diets were tested Some of these diets were given twice and each one was used over a period of three days At the end of each interval blood and urine analyses were made the results of which are recorded in a table and are

but during the tests with full diets, diets rich in certain carbohydrates, and diets rich in fat the condition remained stationary or became worse

The authors give three possible explanations for their findings

1 That carbohydrates absorbed into the blood stream were directly responsible for the symptoms

2 That the protein element in the carbohydrate foods was responsible

3. That the ingestion of the offending carbohydrate foods deranged the intestinal digestion and caused the absorption of toxic substances which in some way were related to the production of the ocular condition

They are inclined to favor the third possibility particularly as tests of cutaneous hypersensitivity with sixty proteins were without a positive reaction

THOMAS D ALLEN M D

Colombo, G L Bilateral Changes of the Cornea in an Airman. *Brit J Ophth* 1931 v 553.

tion of cold accompanied by brief lachrymation At first he had considerable difficulty in keeping his eyes open but later could do so easily The lachrymation had then ceased and there was a sensation

able difficulty Twenty minutes after his descent vision was 20/200 in the right eye and 10/200 in the left. The right cornea was diffusely opaque like ground glass especially in the center The opacity was in the superficial layers of the cornea, the epi

there was no loosening of the corneal epithelium. The skin of the cheeks and nose showed frost bite

mal secretion was decreased and the cornea was insufficiently moistened In addition, the air resistance at the rapid rate of speed probably exerted a traumatic effect

THOMAS D ALLEN M D

Peter L. C.: Obscure Forms of Posterior Uveitis; Their Relation to Sinus Diseases and Especially the Lessons to be Learned Therefrom. *Pennsylvania M J* 1931 xxv 15

In cases of uveitis a careful study of the sinuses, particularly the posterior ethmoids and sphenoids, is essential even though they may appear normal on inspection A case is cited in which a diagnosis of tuberculous uveitis was made. Tuberculin treatment was given but was without effect. Two rhinologists made a negative report, but examination by a third revealed well advanced disease of both sphenoid and posterior ethmoid groups with apparent occlusion of the ostia Operation confirmed the diagnosis

The author states that sinus disease as a possible etiological factor should be borne in mind in the

THOMAS D ALLEN M D

Hektoen, L. The Specific Precipitin Reaction of the Lens. *Am J Ophth* 1931 xiv 909

Hektoen has done considerable work on the specific precipitin reaction of the lens. So far as is known, the lens is the only organ in the body which has this specific property The lens of one animal is the same as that of another although other organs

differ The lenses of mammals, birds, the amphibia, and fish have been studied. A lens antiserum produced, let us say by injecting a rabbit or guinea pig with beef lens, will react in precipitation, anaphylaxis, and complement fixation tests not only with beef lens but also with the lens of other mammals, of birds, and of the amphibia. With fish lens, however the reaction is very faint. The specificity of the reaction is determined not by species as in other immune reactions (blood, serum bacteria), but by the organ from which the antigen is derived

THOMAS D ALLEN M.D

Gifford H : Late Traumatic Detachment of the Retina. *Am J Ophth* 1921 iv 803.

Gifford complains that practically all authors of *ophthalmic textbooks have failed to appreciate* properly the relationship between an injury and subsequent detachment of the retina. He reviews a number of cases. *In the first detachment occurred* four years after an injury from a sling shot. In another case, eleven years previous to his examination one eye had been injured by a blow with a piece of rubber hose at the time Gifford examined

On the basis of his experience with a number of such cases *Gifford concludes that it is best to apply* prophylactic measures at the time of the injury He keeps the patient in bed or sitting at ease with *both eyes slightly bandaged for at least one week*, and causes sweating by the administration of salicylate or pilocarpin. He warns the patient of the *possibility of detachment of the retina and advises* him to avoid occupations or games involving much chance of bumps or jolts. With regard to disability *insurance, etc he advises the patient not to settle for damages* or compensation except on a contingent basis with full recognition in writing of the possibility of future loss of sight from late detachment.

THOMAS D ALLEN M.D

Holt Forceps Tangen erations 21 v 544.

The author aims to produce a subconjunctival tunnel into the anterior chamber which will stay well illustrated.

junctival incision does not approach the limbus at any point closer than 5 or 6 mm. The conjunctiva is undermined toward the limbus and a keratome is inserted into the anterior chamber 2 mm. from the corneoscleral juncture With a strong light from below Holth watches the point of the keratome as it enters the anterior chamber A 4 mm. incision is made and the keratome withdrawn obliquely so as not to injure the capsule of the lens. Usually the iris follows into the wound and he cuts the pupillary sphincter He tries to leave in the wound a small portion of each pillar of the iris Cutting the pupillary sphincter tends to keep the pupil from being drawn upward

In a modification of this operation Holth introduces a punch forceps into the anterior chamber at the nasal side of the keratome incision and punches out a portion of the sclera 3 by 1 mm tangential to the limbus and 1 mm from it. Then instead of drawing out the iris and cutting the pupillary sphincter he does an iridotomy at the extreme periphery

He claims that in both of these operations late infections are practically done away with as the wound is covered by more conjunctival tissue than following trephination none of the cornea and only a portion of sclera including Descemet s membrane, the canal of Schlemm and some of the insertion of the ciliary muscle is removed and the ciliary body itself is not exposed. A shallow anterior chamber does not constitute a contra indication.

THOMAS D ALLEN M D

Gifford H.: Peripheral Iridotomy (Curran) in the Treatment of Glaucoma *Am. J Ophth.* 1921 iv 889.

This article sums up the conclusions reached by Gifford on the basis of thirty operations and describes the technique. The latter is as follows

A Knapp knife needle is passed into the anterior chamber at the limbus with the cutting edge toward the limbus the point engages the iris near the periphery with one whipping stitch and the bridge of the iris is cut by passing the knife toward the spaces of Fontana.

In almost every case the tension has been reduced but the time since the operation has been insufficient to warrant conclusions as to the permanent results It is assumed that in glaucoma the flow of aqueous at the pupillary border of the iris is obstructed. One case in which the ordinary iridectomy had been performed without success was relieved by an iridotomy The author suggests that this method be tried in all cases of glaucoma, particularly when there is a strong tendency to ocular hæmorrhage. In many cases atropine is used freely after this operation.

THOMAS D ALLEN M.D

EAR

Lusagna F : Alterations of Orientation in Labyrinth Lesions and of the Central Nervous System *Laryngoscope* 1921 xxxi, 922

origin He further quotes De Cyon to the effect that the inability of the rotated subject to determine the direction of rotation accurately in the dark is due to the change of the planes of the canals More over the frequency of errors in direction seems to be altogether independent of the nature of the stimulus

The three semicircular canals correspond to the three fundamental directions, namely horizontal vertical, and anteroposterior The exact orienta tion and the execution of change in direction by the organism is accomplished under the control of the canals

Von Stein's method of examination of static orientation consists of (1) standing on the toes of both feet (2) standing on the ball of one foot (3) the use of the Goniometer and (4) orientation of the head and body with a stick in regard to the vertical or the horizontal plane His examination of dynamic orientation consists of walking jumping

Marie and Behague have shown that a deep lesion of the frontal lobe of the brain may result in profound disorientation This is manifested by the inability to turn to the right or left to walk toward a fixed object and reach it and to find the way about a room The caloric test of the labyrinth elicited normal responses There was no tendency to fall with the eyes shut Marie's explanation of this observation is that the lesion involves the associated fibers that start from this lobe and go to the Rolandic occipital, and temporal zones, forming the angulus and the uncinatus Lasagna cites a case of his own, that of a wounded soldier with an injury involving the right frontal lobe. Lying in bed at the end of the ward, the patient could not make out whether the wall was on the right or left side, and in walking from the treatment room he turned to the right instead of to the left In trying to get to a fixed point he often turned around and failed to reach it The labyrinth tests revealed a normal labyrinth

In conclusion Lasagna points out that while the semicircular canals have to do with static and dynamic orientation the sense of proper orienta tion in space requires the functioning of the frontal lobes of the brain or of some definite portion of those lobes FRANK J NOVAK, JR M D

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FRANK J NOVAK, JR M D

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Heller I M : Peritonsillar Abscess and Its Radical Treatment *N York M J* 1921 cxiv 642

Heller advises removal of the tonsils during the attack. A certain armamentarium is necessary The mouth gag must be well fitting and have an attached tongue depressor and an anesthetizing tube along its dorsal surface. Such a gag not only holds the jaws well apart but controls the tongue and allows the administration of a steady flow of vaporized ether without interruption Other essentials are a combined electric suction and etherizing pump with a tube attached to the dorsal tube of the tongue depressor and an electric head mirror No

operation.

The affected side is attacked first A small incision is made in the plica triangularis as low as possible just behind the anterior pillar with a sharp pointed knife However g
can always be fo

surface of the gland is brought into view So far the pus is not seen because it lies behind the tonsil at its upper pole or has gravitated below

The dissector is then carried into the superior fossa. Here pus will be found When the pus begins to escape it is taken up with the suction tube as it exudes When the exudation has ceased the tube is slipped to the base of the abscess cavity and every remaining drop of pus is drawn up When it is certain that the abscess is empty the operation is continued as an ordinary tonsillectomy

If the condition is of more than three days standing the posterior surface will be found already dissected by the pus All that then remains to be done is the separation of the attachment of the posterior pillar and the clipping of the tonsil at its base with a snare.

The fossa is swabbed with a weak alcoholic solution of iodine If desired the second tonsil may be removed also as it is rarely found free from infection. The author states that in operating on his first cases he feared to remove the second tonsil but subsequently found that it did not increase the risk and therefore now does it as a routine measure unless there are special contra indications. The bleeding is always less on the inflamed than on the non affected side because of the greater or less occlusion of the surrounding vessels in the former due to continued pressure

Recovery is marvelously prompt as far as symptoms of quinsy are concerned All the acute pains radiating to the ears and the choking sensation on deglutition disappear In their place is the sore throat of a tonsillectomy To most patients this is a decided relief The after treatment and recovery are about the same as in cases of uncomplicated tonsillectomy O M Rott M D

MOUTH

Kazanjian V H : Plastic Surgery of the Lip *J Am M Ass* 1921 lxxvii 1959.

Before any major plastic operation is attempted sepsis must be controlled and the vascularity of the tissues must be increased as much as possible A scar left by sepsis must be excised in order that healthy tissues may be approximated It is often best to wait for healing before attempting the main operation

The underlying supporting structures should always be in place before the reconstruction of the soft tissues is begun and all preliminary operations should lead up to the main procedure

To fill a gap, tissue is usually taken from the immediate vicinity To replace a loss of tissue near the median line of the lip the author takes quadrilateral flaps including the remaining portion of the lip from each side of the gap and such other tissues as are needed from the immediate neighborhood Because of the contraction following the operation it is better to make the flap too large than too narrow

In cases of unilateral destruction of the lip the flap is taken from the opposite lip By this method adequate tissue can be secured and the two lips are made more equal in size

In cases of extensive bilateral destruction the author has obtained excellent results by transplanting flaps from the sides of the opposite lip This method supplies plenty of tissue Its main disadvantage is the alteration it causes in the contour of the face.

In the correction of deformities at the corners of the mouth all scar tissue is excised the corners of the red border are joined together and the space left by the excision is filled in with supporting flaps from above or below or both.

J C Braswell, M D

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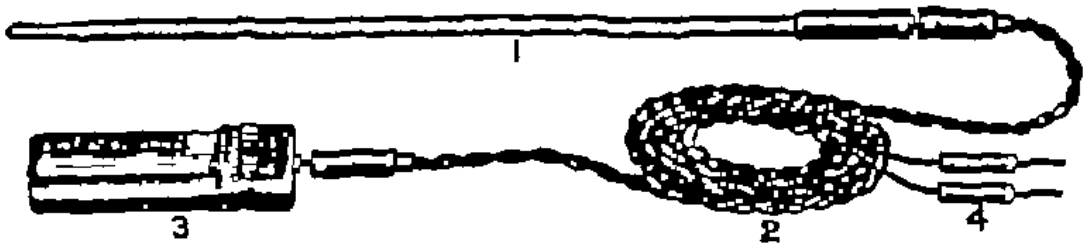
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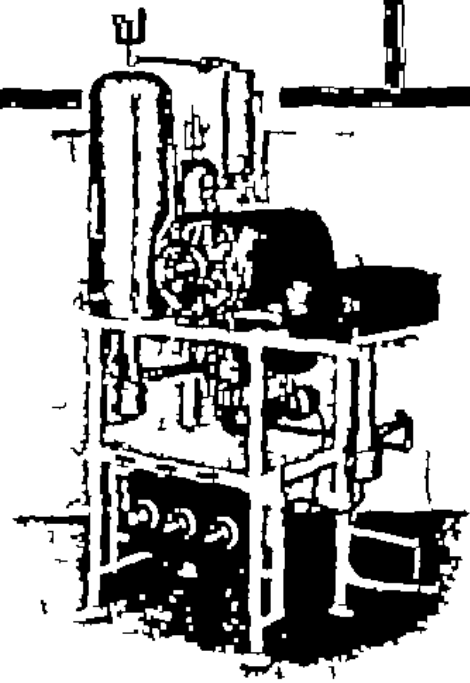
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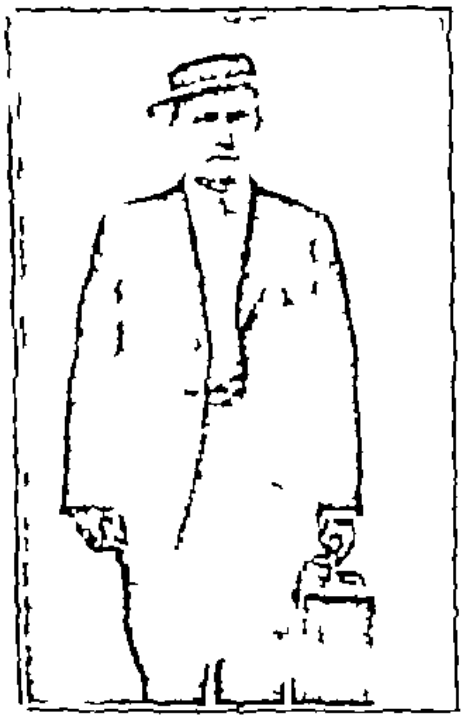
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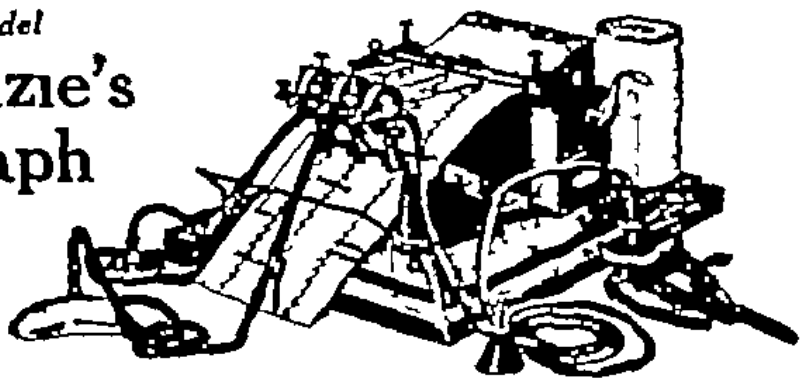
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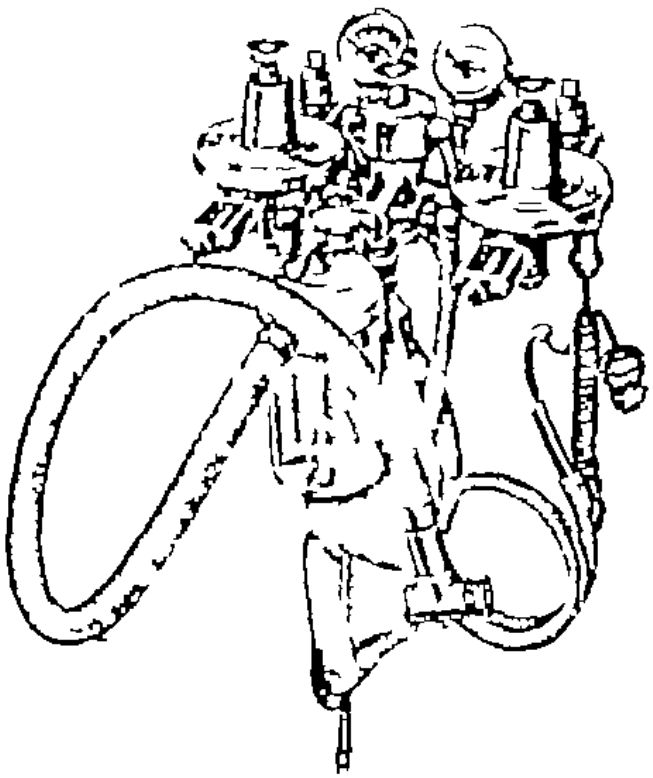
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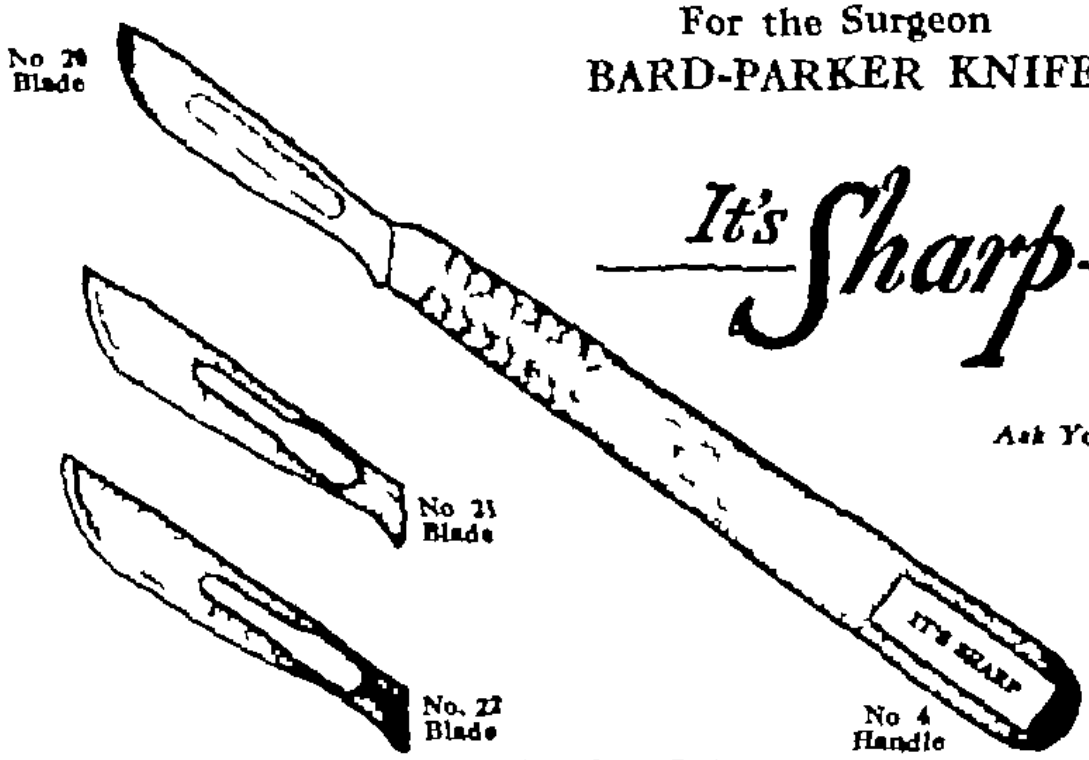
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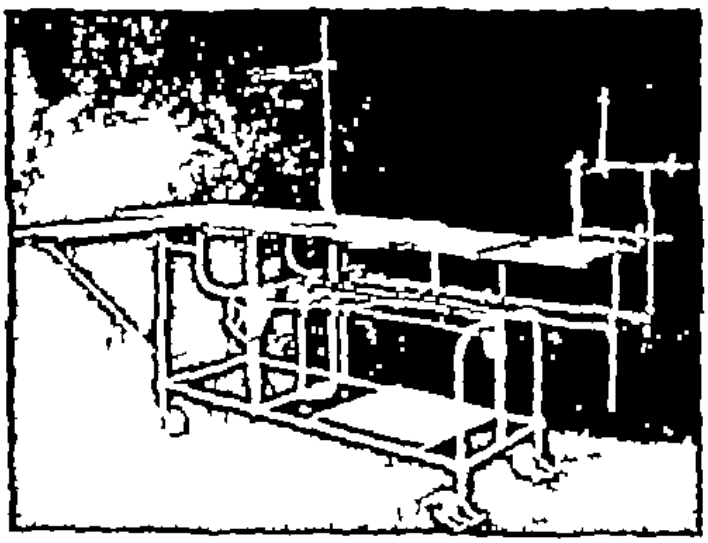
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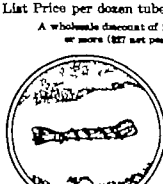
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40-Day Chromic Catgut	No. 165

SIZES 000 00 0 1 2 3 4

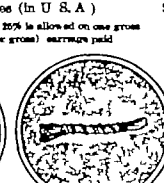
In packages of twel e tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

A wholesale discount of 25% is allowed on one gross or more (227 net per gross) carriage paid



Kalmerid catgut imbedded in agar infected with Staphylococcus pyogenus aureus



Iodized catgut imbedded in the same medium Note the proximity of colonies

Kalmerid Catgut

Antiseptic

KALMERID CATGUT is an improved germicidal suture superseding iodized catgut.[3] It is not only sterile, but, being impregnated with potassium-mercuric-iodide—a double iodine compound—the sutures exert a local bactericidal action in the tissues.[4] It differs from the Claustro-Thermal catgut only in this respect.

The serious disadvantages of iodized catgut—deterioration, irritation, and impaired tensile strength—have been overcome through the use of potassium-mercuric iodide instead of iodine. Unlike iodine, it does not break down under the influence of light or heat, it is chemically stable, and it is neither toxic nor irritating to the tissues. It interferes in no way with the absorption of the sutures, and is not precipitated by the proteins of the body fluids.[5,6,7]

These sutures are boilable. The tubes even may be autoclaved up to 30 pounds pressure for sterilizing their exterior preliminary to use. The heat sterilization procedure is described on the following page.

VARIETIES OF KALMERID CATGUT

Each T be Contains Approximately Sixty Inches

Plain Catgut	Boilable Grade	No. 1205
10-Day Chromic	Boilable Grade	No 1225
20-Day Chromic	Boilable Grade	No. 1245
40-Day Chromic	Boilable Grade	No. 1265

SIZES 000 00 0 1 2 3 4

In packages of twelve tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

A wholesale discount of 25% is allowed on one gross or more (227 net per gross) carriage paid

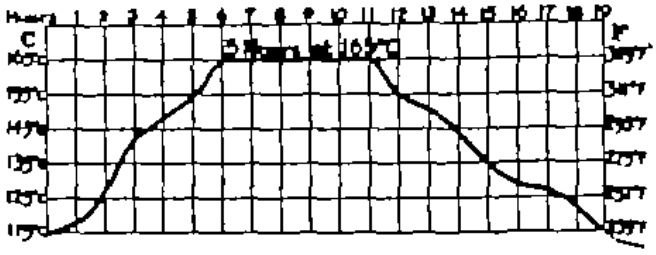
Kalmerid catgut is made also in an extra flexible grade, which is non-boilable, and which is described on the following page.

GERMICIDAL EFFICIENCY AS COMPARED WITH IODIZED CATGUT

The marked inhibitory power of Kalmerid catgut, as compared with iodized sutures, is strikingly shown in these reproductions of culture plates The lighter areas about the imbedded sutures represent zones of no bacterial growth, while the darker portions are masses of Staphylococcus colonies. It is evident that Kalmerid sutures exert in the tissues a far greater antiseptic action than do the usual iodized sutures 7

Method of Sterilization

BOTH Claustro-Thermal and the boilable grade of Kalmerid catgut, described on preceding page, are subjected to the same sterilizing procedure the sealed tubes are submerged in a bath of cumol and there exposed for five hours to the rigorous temperature of 165° C (329° F) It is obvious that sterility is absolutely assured. Rigid bacteriologic control is maintained



Kalmerid Catgut—(Non-Boilable Grade)
Extra Flexible

THE NON BOILABLE grade of Kalmerid catgut differs from the boilable variety described on the preceding page in that it possesses extreme flexibility a characteristic sometimes desired by surgeons accustomed to the use of iodized catgut It is impregnated with potassium-mercuric-iodide, and the sutures exert a local bactericidal action in the tissues

Potassium mercuric-iodide is the double salt of iodine and mercury the chemical formula of which is HgI 2KI. Through its use the serious disadvantages of iodized catgut—deterioration, irritation, and impaired tensile strength—have been overcome It is one of the most active germicides known, exerting a killing action on bacteria about ten times greater than that of iodine. Physiologically it is bland and is entirely compatible with the tissues, not being precipitated by the proteins of the body fluids

VARIETIES OF THE NON BOILABLE GRADE OF KALMERID CATGUT

Each Tube Contains Approximately Sixty Inches

Plain Catgut	Non-Boilable Grade	No 1405
10-Day Chromic	Non-Boilable Grade	No 1425
20-Day Chromic	Non-Boilable Grade	No. 1445
40-Day Chromic	Non-Boilable Grade	No. 1485

SIZES 000 00 0 1 2 3 4

In packages of twelve tubes of kind and size

List Price per dozen tubes (in U S A.) $3

A wholesale discount of 25% is allowed on one gross or more (27 net per gross) carriage paid

Kalmerid Kangaroo Tendons
Boilable and Non-Boilable

KALMERID KANGAROO TENDONS are the sutures par excellence for those procedures in which post-operative tension is excessive, or long continued apposition necessary such as in herniotomy and in tendon and bone suturing They are not only sterile, but, in addition, are impregnated with potassium-mercuric-iodide, as in Kalmerid catgut, which enables them to exert a local bactericidal action in the tissues

They are genuine kangaroo tendons they are smooth, straight, of uniform contour and possess a tensile strength about twice that of catgut.

The tendons are chromicized, and so accurately is the process regulated that each size will maintain apposition in fascia or in tendon for approximately thirty days.

Kalmerid kangaroo tendons are prepared in two grades—boilable and non-boilable. The latter are extremely pliable

VARIETIES AND SIZES

Non Boilable are Product No 870
The Boilable are Product No. 880

Each Tube Contains One Tendon
Lengths Vary From 12 to 20 Inches

STANDARD SIZES 0 2 4 6 8

Formerly termed extra fine fine, medium, coarse and extra coarse, respectively

In packages of twelve tubes of kind and size

List Price per dozen tubes (in U S. A.) $3

A wholesale discount of 25% is allowed on one gross or more (27 net per gross) carriage paid

THE PERMEATION OF KALMERID SUTURES BY POTASSIUM MERCURIC-IODIDE



The light shaded specimen is a cross section of a strand of plain Kalmerid catgut, highly magnified

The dark shaded specimen is a cross section of the same strand reacted upon by ammonium sulphid to precipitate the mercuric element.

The uniform color throughout the section shows the thorough permeation by the potassium-mercuric-iodide, the equable distribution of which assures a supply of this germicidal substance in the tissues until the suture is entirely absorbed.

General Qualities

THE SALIENT FEATURES of all varieties of D&G Sutures are compatibility with the tissues, perfect absorbability maximum tensile strength, accuracy of sizes, flexibility and absolute sterility They are unaffected by age or light, or by extremes of climatic temperatures.

Unabsorbable Sutures

Heat Sterilized After Closure of Tubes—Boilable

Product No		Approximate Quantity in Each Tube	Standard Sizes
350	Celluloid Linen Thread	60 Inches	000, 00 0
360	Horsehair	4 28-In. Sutures	00
390	Plain Silkworm Gut	4 14-In. Sutures	00 0 1
400	Black Silkworm Gut	4 14 In. Sutures	00, 0 1
450	White Twisted Silk	60 In	000 00, 0 1 2, 3
460	Black Twisted Silk	60 In	000 0 2
480	White Braided Silk	60 In	00 0, 2, 4
490	Black Braided Silk	60 In	00 1 4

1 packages of tu lve tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

Wholesale discount of 25% allowed on gross or more carriage paid

Short Length Sutures

Heat Sterilized After Closure of Tubes—Boilable

Product No		Approximate Quantity in Each Tube	Standard Sizes
802	Plain Catgut.	20 In	00, 0 1 2, 3
812	10-Day Chromic Catgut	20 In	00 0, 1 2, 3
822	20-Day Chromic Catgut	20 In	00 0, 1, 2, 3
862	Horsehair	2 28-In. Sutures	00
872	Plain Silkworm Gut	2 14-In. Sutures	0
882	White Twisted Silk	20 In	000 0 2

In packages of twelve tubes of a kind and size

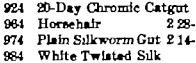
List Price per dozen tubes (in U S A.) $1.50

Wholesale discount of 25% allowed on gross or more carriage paid

Sutures With Needles

Heat Sterilized After Closure of Tubes—Boilable

Product No.		Approximate Quantity in Each Tube	Standard Sizes
904	Plain Catgut.	20 In	00 0 1 2, 3
914	10-Day Chromic Catgut	20 In	00 0 1, 2, 3
924	20-Day Chromic Catgut	20 In	00 0, 1, 2, 3
964	Horsehair	2 28-In. Sutures	00
974	Plain Silkworm Gut	2 14-In. Sutures	0
984	White Twisted Silk	20 In	000 0 2



Emergency Needle
For Skin, Muscle, or Tendon

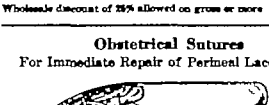
In packages of twelve tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

Wholesale discount of 25% allowed on gross or more carriage paid

Obstetrical Sutures

For Immediate Repair of Perineal Lacerations



Each tube contains two 25-inch sutures of 40-day chromic catgut, size 2, one of which is threaded upon a large full-curved needle. Sterilized by the Claustro-Thermal method. Boilable.

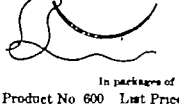
One tube in a package

Product No. 650. List Price per tube $ .35

Wholesale discount of 25% allowed on gross or more carriage paid

Circumcision Sutures

Heat Sterilized After Closure of Tubes—Boilable



Each tube contains a 30-inch suture of plain catgut, size 00 threaded upon a small full-curved needle.

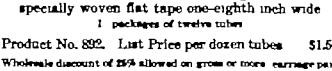
In packages of twelve tubes

Product No 600 List Price per dozen tubes $3

Wholesale discount of 25% allowed on gross or more carriage paid

Umbilical Tape

Heat Sterilized After Closure of Tubes—Boilable



Each tube contains two 12 inch ligatures of a specially woven flat tape one-eighth inch wide

1 packages of twelve tubes

Product No. 892. List Price per dozen tubes $1.50

Wholesale discount of 25% allowed on gross or more carriage paid

Standard Sizes For All Sutures

000
00
0
1
2
3
4
6
8

IN conformity with the long recognized need for a unified system of sizes, the standard scale of catgut sizes now embraces all sutures, including kangaroo tendons, silk horsehair silkworm gut, and Pagenstecher s celluloid linen thread.

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8 The Absorption and Tensile Strength of Certain Absorbable Animal Ligatures By Gray Phillips M D Jour A M A., April 25, 1914.

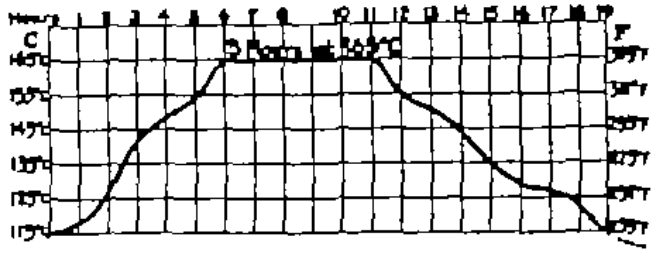
9 Chromicized Catgut Prepared To Resist Absorption For Definite Periods Davis & Geck Inc 1916

10 Absorbable Animal Ligatures By Thomas A Berry hill, M D., Medical Director United States N vy U S Naval Medical Bulletin J by 1913.

Reprints will be sent upon request

Method of Sterilization

BOTH Claustro-Thermal and the boilable grade of Kalmerid catgut, described on preceding page, are subjected to the same sterilizing procedure the sealed tubes are submerged in a bath of cumol and there exposed for five hours to the rigorous temperature of 165 C (329° F.) It is obvious that sterility is absolutely assured. Rigid bacteriologic control is maintained



Kalmerid Catgut—(Non-Boilable Grade)
Extra Flexible

THE NON BOILABLE grade of Kalmerid catgut differs from the boilable variety described on the preceding page in that it possesses extreme flexibility a characteristic sometimes desired by surgeons accustomed to the use of iodized catgut It is impregnated with potassium-mercuric iodide, and the sutures exert a local bactericidal action in the tissues

Potassium mercuric-iodide is the double salt of iodine and mercury the chemical formula of which is HgI 2KI Through its use the serious disadvantages of iodized catgut—deterioration, irritation, and impaired tensile strength -have been overcome [4] It is one of the most active germicides known, exerting a killing action on bacteria about ten times greater than that of iodine. Physiologically it is bland and is entirely compatible with the tissues, not being precipitated by the proteins of the body fluids

VARIETIES OF THE NON-BOILABLE GRADE OF KALMERID CATGUT

Each Tube Contains Approximately Sixty Inches

Plain Catgut	Non-Boilable Grade	No 1405
10-Day Chromic	Non-Boilable Grade	No. 1425
20-Day Chromic	Non-Boilable Grade	No. 1445
40-Day Chromic	Non-Boilable Grade	No. 1465

SIZES 000 00 0 1 2 3 4

In packages of twelve tubes of a kind and size

List Price per dozen tubes (in U. S. A.) $3

A wholesale discount of 25% is allowed on one gross or more (327 net per gross) carriage paid

Kalmerid Kangaroo Tendons
Boilable and Non-Boilable

KALMERID KANGAROO TENDONS are the sutures par excellence for those procedures in which post-operative tension is excessive, or long continued apposition necessary such as in herniotomy and in tendon and bone suturing They are not only sterile but, in addition, are impregnated with potassium-mercuric-iodide as in Kalmerid catgut, which enables them to exert a local bactericidal action in the tissues

They are genuine kangaroo tendons they are smooth, straight, of uniform contour and possess a tensile strength about twice that of catgut.

The tendons are chromicized, and so accurately is the process regulated that each size will maintain apposition in fascia or in tendon for approximately thirty days.[4]

Kalmerid kangaroo tendons are prepared in two grades—boilable and non-boilable. The latter are extremely pliable.

VARIETIES AND SIZES

Non-Boilable are Product No. 370
The Boilable are Product No. 380

Each Tube Contains One Tension
Lengths Vary From 12 to 20 Inches

STANDARD SIZES 0 2 4 6 8

Formerly termed extra fine, fine medium, coarse and extra coarse, respectively

In packages of twelve tubes of kind and size

List Price per dozen tubes (in U. S. A.) $3

A wholesale discount of 25% is allowed on one gross or more (327 net per gross) carriage paid

THE PERMEATION OF KALMERID SUTURES BY POTASSIUM MERCURIC-IODIDE



The light shaded specimen is a cross section of a strand of plain Kalmerid catgut, highly magnified.

The dark shaded specimen is a cross section of the same strand reacted upon by ammonium sulphid to precipitate the mercuric element

The uniform color throughout the section shows the thorough permeation by the potassium-mercuric-iodide, the equable distribution of which assures a supply of this germicidal substance in the tissues until the suture is entirely absorbed.

General Qualities

THE SALIENT FEATURES of all varieties of D&G Sutures are compatibility with the tissues, perfect absorbability maximum tensile strength, accuracy of sizes, flexibility and absolute sterility They are unaffected by age or light, or by extremes of climatic temperatures.

Unabsorbable Sutures

Heat Sterilized After Closure of Tubes—Boilable

Product No.		Approximate Quantity in Each Tube	Standard sizes
350	Celluloid-Linen Thread	60 Inches	000 00, 0
360	Horsehair	4 28-In. Sutures	00
390	Plain Silkworm Gut	4 14-In. Sutures	00 0 1
400	Black Silkworm Gut	4 14 In. Sutures	00 0 1
450	White Twisted Silk	60 In	000 00 0 1 2, 3
460	Black Twisted Silk	60 In	000 0 2
480	White Braided Silk	60 In	00 0 2, 4
490	Black Braided Silk	60 In	00 1, 4

In packages of twelve tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

Wholesale discount of 25% allowed on gross or more carriage paid

Short Length Sutures

Heat Sterilized After Closure of Tubes—Boilable

Product No		Approximate Quantity In Each Tube	Standard sizes
802	Plain Catgut.	20 In	00, 0 1, 2, 3
812	10-Day Chromic Catgut	20 In	00, 0 1 2, 3
822	20-Day Chromic Catgut	20 In	00, 0, 1 2, 3
862	Horsehair	2 28-In. Sutures	00
872	Plain Silkworm Gut	2 14-In. Sutures	0
882	White Twisted Silk	20 In	000, 0 2

In packages of twelve tubes of a kind and size

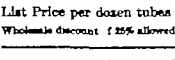
List Price per dozen tubes (in U S A.) $1.50

Wholesale discount of 25% allowed on gross or more carriage paid

Sutures With Needles

Heat Sterilized After Closure of Tubes—Boilable

Product No.		Approximate Quantity In Each Tube	Standard sizes
904	Plain Catgut.	20 In	00 0, 1 2, 3
914	10-Day Chromic Catgut	20 In	00 0, 1, 2, 3
924	20-Day Chromic Catgut	20 In	00 0, 1, 2, 3
964	Horsehair	2 28-In. Sutures	00
974	Plain Silkworm Gut	2 14-In. Sutures	0
984	White Twisted Silk	20 In	000 0 2



Emergency Needles
For Skin, Muscle or Tendon

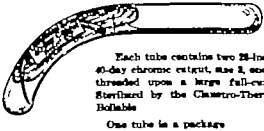
In packages of twelve tubes of a kind and size

List Price per dozen tubes (in U S. A.) $3

Wholesale discount of 25% allowed on gross or more, carriage paid

Obstetrical Sutures

For Immediate Repair of Perineal Lacerations



Each tube contains two 28-inch sutures of 40-day chromic catgut, size 2, one of which is threaded upon a large full-curved needle. Sterilized by the Chastro-Thermal method. Boilable

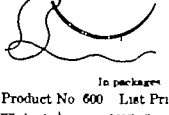
One tube in a package

Product No. 650. List Price per tube $ .35

Wholesale discount of 25% allowed on gross or more carriage paid

Circumcision Sutures

Heat Sterilized After Closure of Tubes—Boilable



Each tube contains a 30-inch suture of plain catgut, size 00 threaded upon a small full-curved needle.

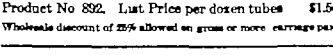
In packages of twelve tubes

Product No 600 List Price per dozen tubes $3

Wholesale discount of 25% allowed on gross or more carriage paid

Umbilical Tape

Heat Sterilized After Closure of Tubes—Boilable



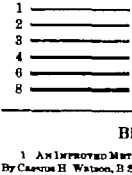
Each tube contains two 12 inch ligatures of a specially woven flat tape one-eighth inch wide

In packages of twelve tubes

Product No 892. List Price per dozen tubes $1.50

Wholesale discount of 25% allowed on gross or more carriage paid

Standard Sizes For All Sutures



IN conformity with the long recognized need for a unified system of sizes, the standard scale of catgut sizes now embraces all sutures, including kangaroo tendons, silk, horsehair silkworm gut, and Pagenstecher s celluloid linen thread.

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Reprints will be sent upon request

D&G Sutures represent Value Beyond Price



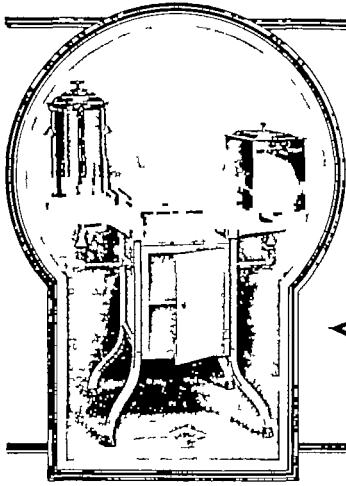
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Containing One Dozen Tubes of a Kind and Size

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THE standard wholesale discount of 25% from list prices is accorded hospitals and surgeons on any quantity of sutures, of a kind or assorted, down to one gross. Under a gross the list prices are net, without discount.

D&G sutures are sold by practically all of the responsible dealers in surgical supplies, or may be obtained, carriage paid, direct from Davis & Geck, Inc.

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of
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In one small unit—

Complete Sterilization

INSTRUMENT and Dressing Sterilizers are combined with Water Sterilizer in one compact

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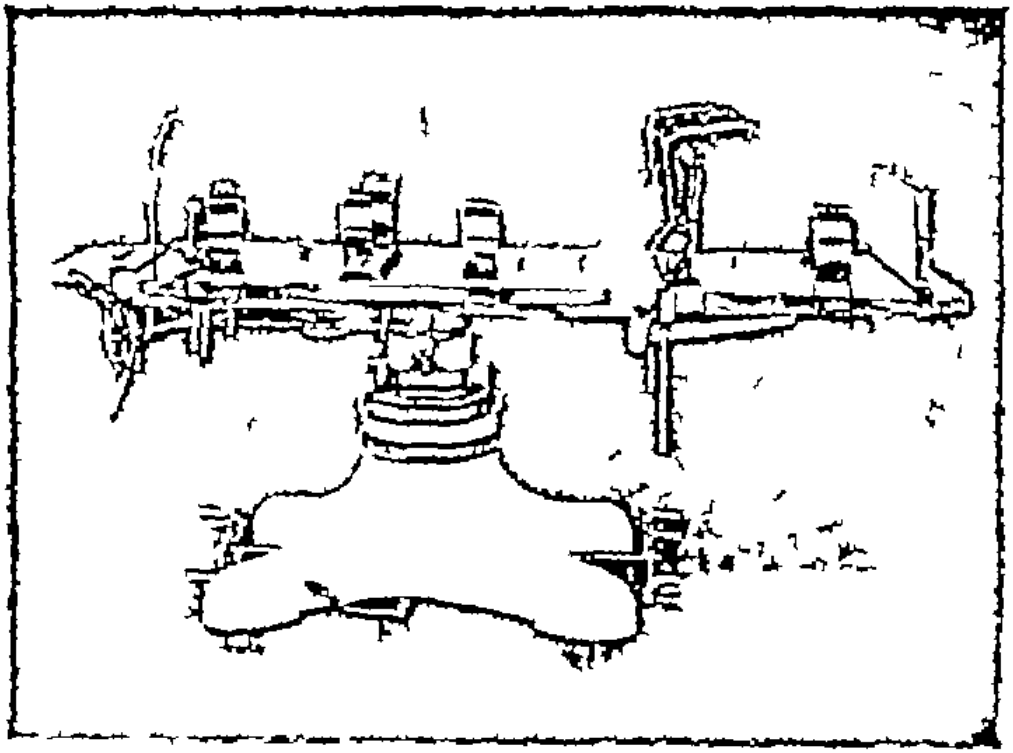
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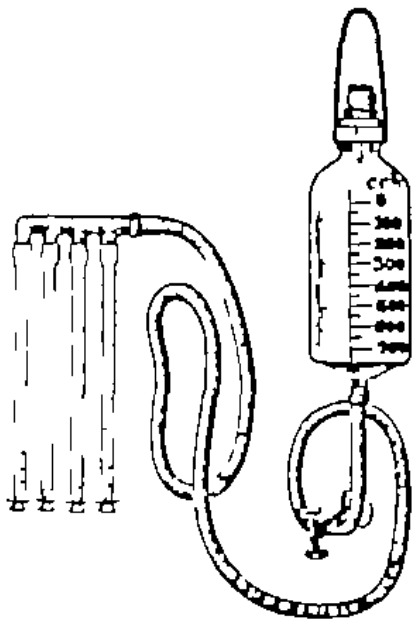
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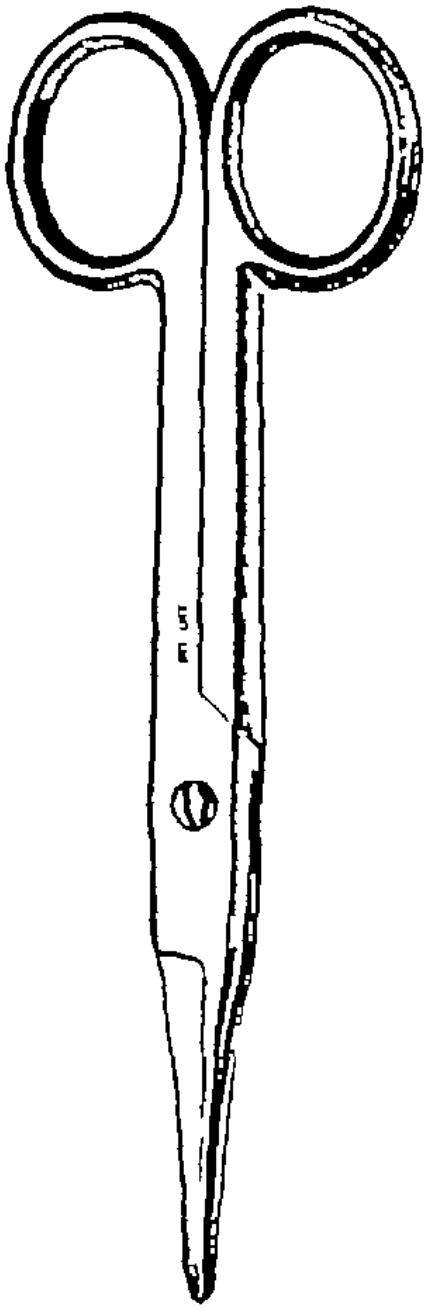
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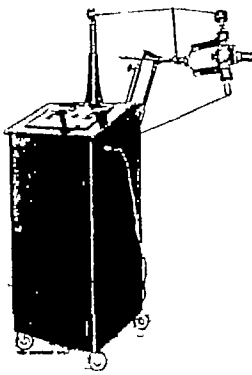
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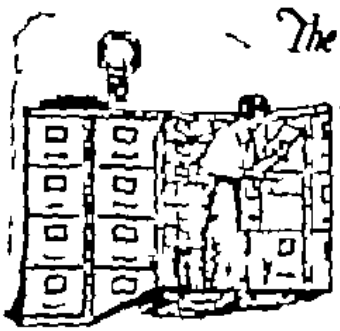
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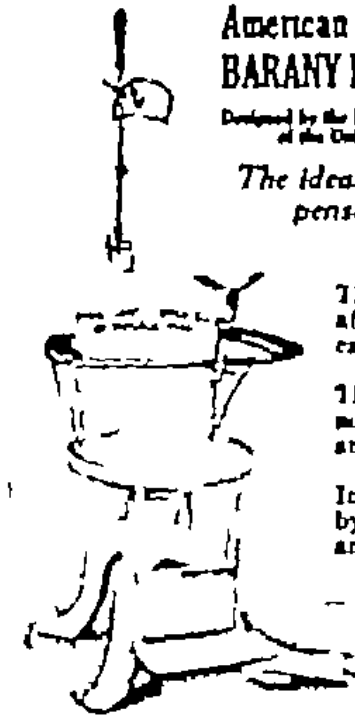
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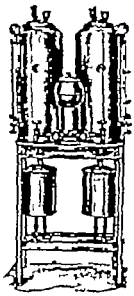
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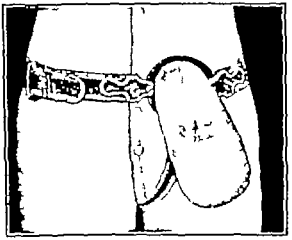


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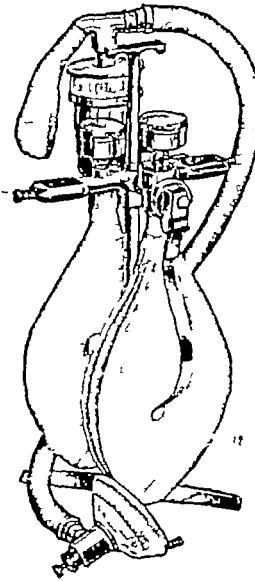
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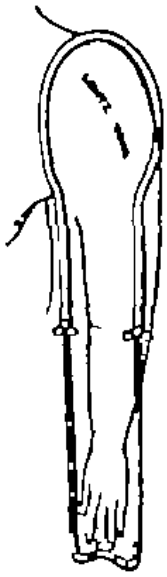


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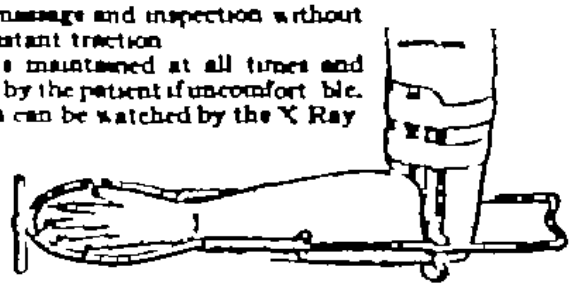


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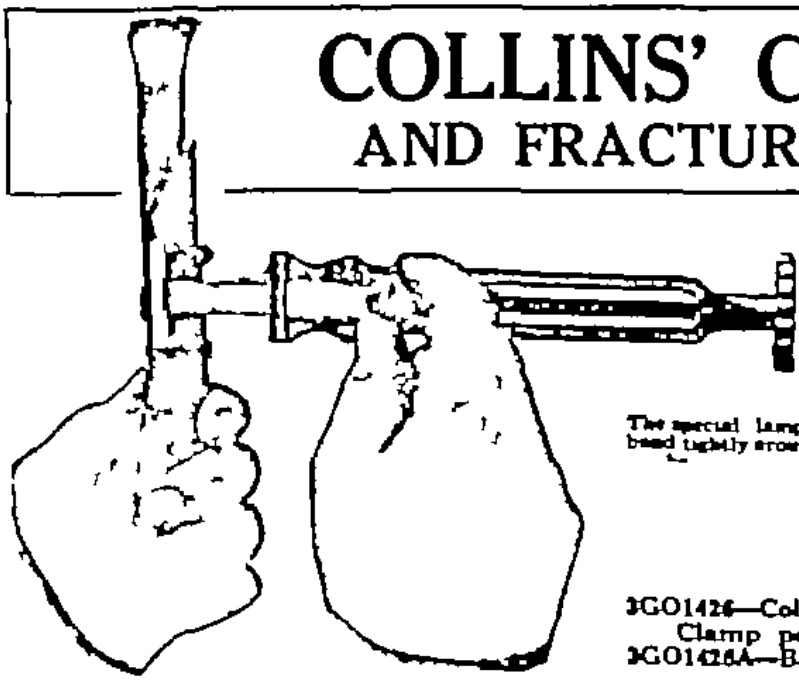
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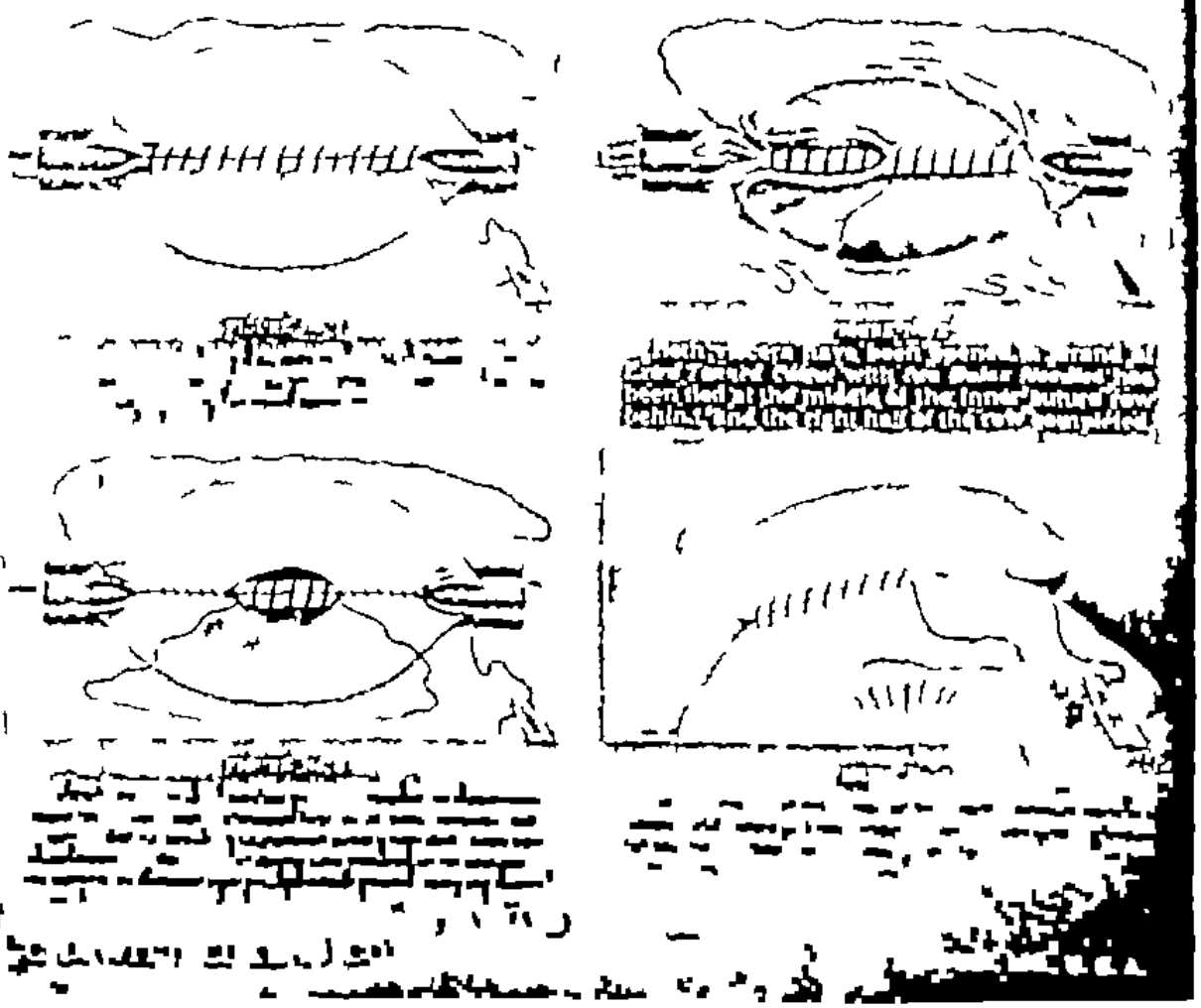




Fig 4a Fig 4a Fig 4 Fig 4c Fig 4c

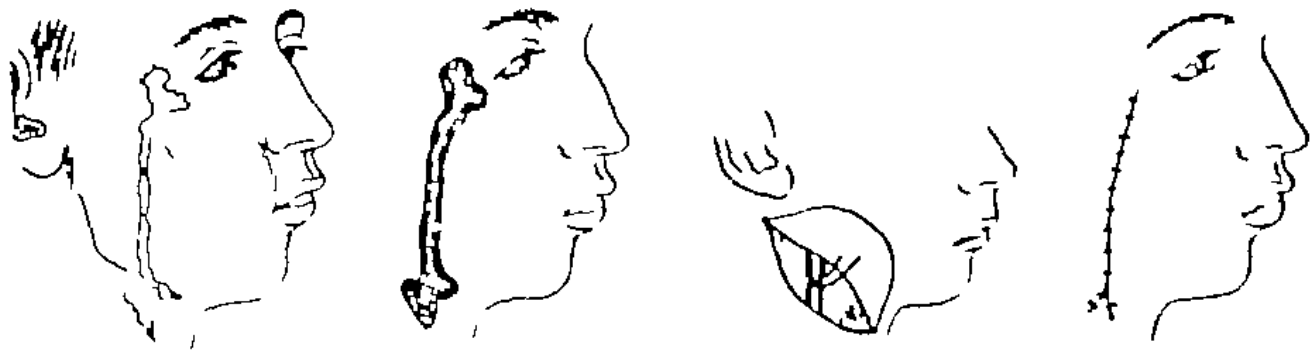


Fig 4b Fig 4b Fig 4f Fig 4h



Fig 4d Fig 4d Fig 4d Fig 4d

SURGERY, GYNECOLOGY AND OBSTETRICS

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RECONSTRUCTION SURGERY OF THE FACE[1 2]

BY V P BLAIR M.D F.A.C.S ST LOUIS

IT is not generally recognized that, on the average, larger facial defects are created in the treatment of cancer than by battle casualties These and punitive mutilations, have made plastic surgery of the face one of the earliest types recorded Long before the war its possibilities were beginning to take on concrete expression but to date the encomiums that have been showered upon it are at least partially dependent upon comparison for their justification

The most important part of any surgical procedure is a plan and the more closely and intimately this plan fits the needs of the case, the better will be the result In reconstruction of the face the plan should be as accurate and comprehensive as those used by the oculist, the dentist, or the journeyman tailor In the creation of the plan we should mimic the methods of the sculptor or the tailor who materializes his conceptions in clay or paper before attacking the marble or cloth If reconstruction surgery of the face should continue to develop along the lines upon which it is well started I can see no reason why, in the majority of cases, given a healthy patient and a really good surgeon (who must have the feeling of an artist the skill of an ordinary tailor and the tenacity of a rat terrier) there should not be produced in flesh and bone features that compare favorably with those created by the accepted sculptor or painter but it will require skill and training and no end of hard work Until such men are trained to work in this line the results must continue to be archaic and not incomparable to those that would follow if each man here were from now on forced to make his own clothes Some would do better than others and certain individuals would attain to comparative skill but it is probable that there would not be one first-class tailor in the entire number

Satisfaction with one's appearance has a tremendous bearing on poise and self-confidence. Disregarding battle casualties skill in the correction of facial defects will open up a very substantial field of legitimate and much needed surgery

In the making of the plan the most important single thing to be regarded is that the value of facial balance far outweighs that of any individual feature. When preserved or restored it has saved many a result that had little else to recommend it and when lacking will seriously mar the best technical efforts

Mars feels that he has done enough for surgery when he furnishes the victims and has always frowned upon the interruptions incidental to treatment, but in spite of this through the kindly analysis given by our late friend General Gorgas and the characteristic Go to it which was the response

[1] Presented before the Clinical Congress of American College of Surgeons, Philadelphia, October 26 1921



Fig 1a

of General Ireland to any worth while propo-
sition that seemed feasible the planning of
facial operations received a tremendous im-
petus in this country by the use of the artists,
sculptors and photographer which the
army furnished to co-operate with the
surgeon in all stations especially designed for
this work

I want to take advantage of the oppor
tunity you have given me this evening to
present a few types of facial cases that have
been treated in the army and do this both
as a tribute to the consideration this work
received from the medical and dental depart
ments at large and also to record possibly a
comparatively early stage in the future
development of this work

mucocutaneous junction bordering the defect and
the mucosa dissected up so as to permit the implan
tation of the flap

Figures 2a and b Simple excision of a broad
nal repair of the defect Where the scar is
excis-
will
h a
the
are
can
ition
the

the undermining is limited

ie plan of repair
ren was excised
indicated by
and the tissues
undermined to the extent indicated by the dotted
line Above and external to the excised scar the
plane of undermining was made superficial to the
buccal and temporal fascia while below and in
front of it the soft tissues were raised from the bone
The lower flap was made to overlap the exposed
buccal and temporal fascia and sutured in place
This filled the defect and raised up the cheek and
corner of the mouth At a subsequent operation

pressure atrophy due to the buttons holding deep
tension sutures held in place This is a
photograph of the patient after completion of his
case.

part of the flap above the dotted line
and some subcutaneous tissue below the dotted
line the full thickness, including the mucosa was
taken with the flap An incision was made along the

Figures 4a 4b 4c 4d 4e A shell wound through



Fig 1b.

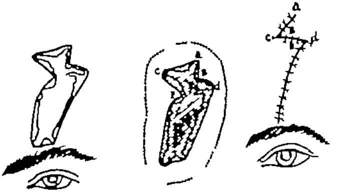


Fig 2a.



Fig. 2b.

piece of shell spinning around like a circular saw could cut a very deep and wide gash in the tissues.

Figure 4b Diagram illustrating scheme of correction The first figure in the drawing represents the condition on return from overseas. The shading
plan of scar excision
the cheek into the
s the extent of the
deep undermining which was just superficial to the bone while there was a less extensive plane of undermining done bewteen the skin and the muscle Note the conservative manner in which the scar excision was done and how the external canthus as well as the whole cheek was raised by the suturing In suturing the buccal mucosa was approximated with tannated gut and the intermediate tissues were overlapped with plane gut for the double purpose of elevating the cheek and corner of the mouth and of filling out the thickness of the cheek. This latter line of sutures was reinforced by deep mattress silkworm-gut stay sutures which were tied over rubber tubing or buttons on each side of the wound Skin was closed with interrupted horsehair The depth of the wound was freely drained with rubber dam strips both on the buccal and external surfaces This latter step is important Such wounds are always soiled and have irregular spaces in their depths that cannot be immediatly obliterated to advantage It is my observation that the blood clot can play only a sinister rôle in plastic surgery The third figure in the drawing shows the preliminary ligation of the external carotid artery as a means of limiting hæmorrhage A temporary control of the opposite common or external carotid is usually of further advantage In the Casualty Clearing Station it was a notable fact that wounded soldiers bled
large
later
ed and the hæmorrhage from excision of scars becomes so excessive as often to threaten life if very careful preventive measures are not employed The mere use of hæmostatic forceps is not sufficient

wound sutured.

Figure 4c The roentgenogram to the left shows the defect in the body of the lower jaw corresponding to the cheek cut Note that the ramus is drawn forward which has lessened the apparant extent of the defect The sliding pedicle graft was taken from the lower border of the mandible and fastened in place with
the surface
mentary d
part of the wound not in contact with the bone The mouth was accidentally opened during the procedure This is a routine precaution against the blood clot which some operators court The roentgenogram to the right shows the bone graft grown solid. During the healing process both jaws were fixed by a splint made by Captain Dameron D C U S A

Figure 4d Profile and full front views of the case showing condition at the time of operation and at discharge from the hospital. Note that the external canthus the corner of the mouth and the cheek have all been elevated

Figures 5a 5b 5c 5d 5e and 5f Figure 5a Drawing of case in which most of the injury was confined to the inside of the mouth destroying the lining of the right cheek a section of the body of the mandible and some of the full thickness of the cheek near the angle of the mouth The malar bone was fractured and pushed outward which resulted in cheek bone and zygoma being more prominent The first step in the operative treatment was to restore the lining of the cheek and also the skin about the corner of the mouth This was done by removing all of the scar and then cutting a long flap from the neck and chest which was drawn into the mouth through an incision in the lower buccal fornix, and the tip of the flap was drawn out through the oral fissure and sutured into the external cheek defect, as shown in the central drawing Twelve days later the pedicle was cut and the base of the flap returned to the neck The figure to the right shows the amount of the flap that was left in the cheek.

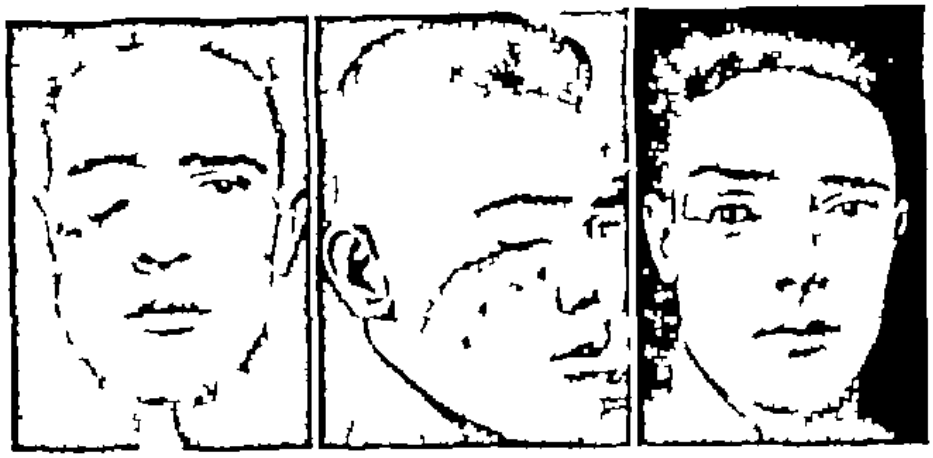


Fig 3a Fig 3c Fig 3d.

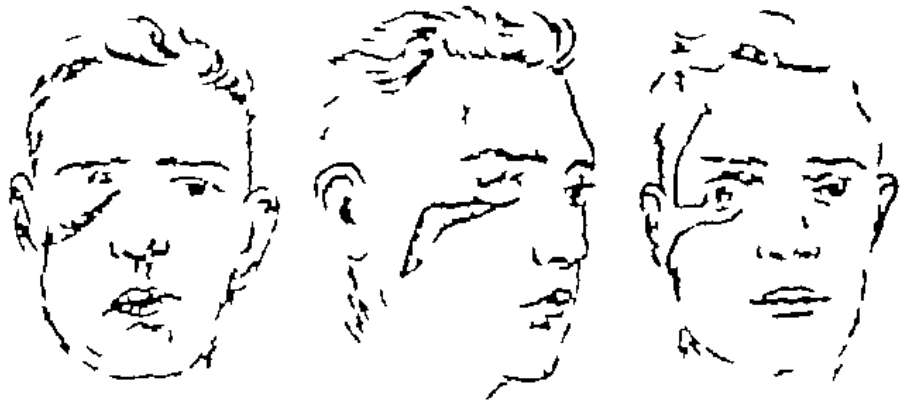


Fig 3b.

each pocket in the neck resulting from the undermining and the potential pocket resulting from the twist made where the flap turns on itself to enter the mouth and the space between the flap and the cheek are all drained by rubber dam drains which have been sutured in place The latter two of these drains are of particular importance in cases in which the parotid gland is still active In many it seems to have been destroyed by obstruction of the parotid

membrane. Occasionally when redundant it rises into folds formed by the scar base and requires partial excision If it is hair-bearing the hair will continue to grow and will require trimming until it is destroyed by radium

Figure 3c The roentgenogram shows the repair of the bone defect which was closed partly by a sliding bone graft made from the lower end of the ramus and partly by an outgrowth of new bone which was formed as the two ends of the bone were slowly separated by a traction splint This gradual separation of the ends restored the jaw to its normal occlusion, the potential gap being filled with new bone which formed concurrently with the separation of the fragments The roentgenogram also shows the gap in the ramus where the subcutaneous saw cut was made and shows the bar of new bone that helps to bridge the gap



Fig 5a

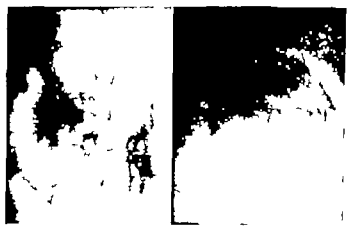


Fig 5c

that had to be removed from right cheek bone to make it correspond to the left the normal side

Figure 5c The photograph to the left shows distortion of cheek and mouth original condition



Fig. 5b



Fig 5b



Fig 5d.



Fig 5d



Fig 5e



Fig 5e.



Fig. 5f.



Fig 5f

The patient at that time had the posterior part of the body of the right mandible drawn forcefully against the palate The photograph on the right shows the condition when the patient was discharged from the army The jaw bone is solid and he can open his mouth freely

Figure 5f shows the lateral aspect taken at times corresponding to Figures 5e

Figures 6a and 6b Illustrates a case in which a large opening in the anterior part of the palate caused by piece of shell, was repaired from a skin covered pedicle flap taken from the front of the

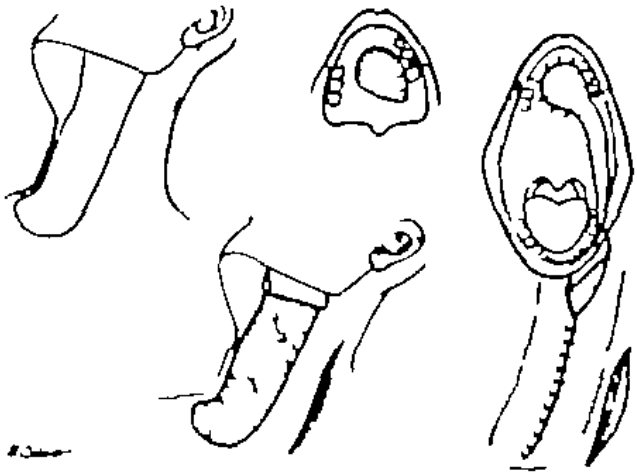


Fig 6a

plate flattened to conform to the general contour of the palate.

a piece of skin [illegible] neck tissue up over the mandible until much of the

made to the bone downward and outward to the lower border of the mandible and then back to the anterior border of the masseter muscles the flaps being dissected entirely free from the periosteum. A corresponding incision was made through the mucosa along the inferior buccal fornix. At the posterior extremity this horizontal incision in the mucosa turned sharply upward to end just beneath the opening of the parotid duct. This vertical part of the intra-oral incision went through not only the mucosa but the buccinator muscle and buccal fascia. The anterior part of each of the two cheek flaps thus mobilized was rotated upward until the edges that formed the lateral borders of the "V" were made to form the free border of the lower lip.

[illegible] sutured to the skin, thus making a vermillion border. Suturing these flaps to the tissue on the point of the chin that had become fixed there by scar in turn fixed these flaps in their new position. Originally there had been some loss of tissue in the left cheek.

posterior to the defect in the neck. The figure to the right shows the flap sutured into the palate defect and the neck defect closed by drawing its borders together. The next step would be to cut the pedicle of the palate flap at the palate border, freshen its granulating surface and after reopening the upper part of the healed neck wound, suture the pedicle back into the neck. This is shown in Figure 6a. The relaxation incision will close of itself. Later these rather rough scars can be excised and more exact approximation made by careful suture. Even the scars can be further improved by the use of radium but a vertical scar in the neck will always be visible.

Figure 6b shows photographs of the condition in various stages. In the one to the right as yet no attempt has been made to improve the neck scar, and the flattening of the upper lip is due to lack of teeth later corrected by a denture. In the middle photograph the patch in the palate forms a rather prominent pad which later with the use of a dental



Fig 6b. Fig. 6b. Fig. 6b

the flaps sutured in place The artist has used some poetic license in portraying the outline of the vermillion border The lower right figure is a good representation of the lateral aspect of the case when finished

Figure 7b The left photograph shows condition when the case reached reconstruction hospital in this country Central figure shows condition after large cheek flaps were brought into place but before the small upper 'A flap was turned down Right figure shows the completed case

Figures 8a 8b 8c 8d, 8e 8f 8g 8h Figure 8a The right hand figure is a diagramatic reproduction of a roentgenogram of a case in which a shell passed through both cheeks splintering the body of the mandible on both sides and tearing a large hole of exit on the right side Owing to the press of war conditions, neither proper fixation nor drainage was established at time of injury and this added to lack of special care in subsequent evacuations, permitted of extensive necrosis of the bone and loss of all teeth in the remaining chin fragment When he arrived at a reconstruction hospital 10 months after injury there was a loss of the body of the mandible from the second molar to the cuspid tooth on the left side and the lower half of the ramus and the body so far



Fig 7a.

tain Daniel McCauley, D C., U S A. and Lieutenant B W Worthley D C., U S A. constructed an aluminum splint to embrace all of the upper teeth which extended in front of the ramus was subcutaneously cut in two transversely by a wire saw and the ends of the body bordering the defect on that side were freshened and wired together after the newly constructed jaw was pried and dragged forward Two heavy wires were pressed around the mental fragment and fastened to the end of the bar on the splint or rather to a downward extension of this bar which brought the line of traction into the plane of the body of the mandible. The figure also shows (1) the cut in the ramus (2) the posterior body fragment including the angle dragged forward (3) the wire uniting the two fragments with its twisted ends protruding for drainage (4) the two circumferencial traction wires passing about the mental fragment. The photograph at the left shows an external view of the splint and wires and the scar due to loss of tissue on the right side of the face. The strain on the splint was so great that it caused pain and threatened the anchorage of the upper teeth To relieve this the patient was put to bed and a counter weight was applied to a cord which was attached to the bar of the splint and passed over a pulley block in the ceiling as shown in Figure 8b After a week or 10 days this weight



Fig 7b Fig. 7b. Fig. 7b.



Fig 8a



Fig 8a



Fig 8c



Fig 8c



Fig 8b



Fig 8d

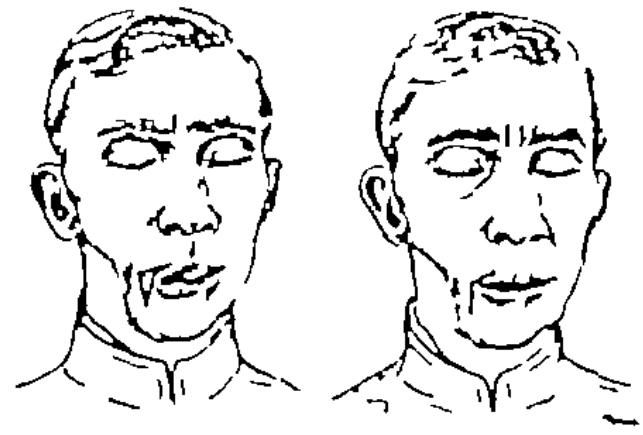


Fig 8d

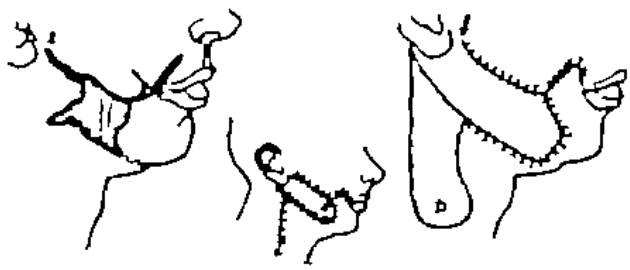


Fig 8c.

extension was dispensed with

The next operative
he transfer of a
check as shown
ade to plant a
this flap was to
to an injury of



Fig 8g Fig. 8g Fig 8h Fig 8h

the parotid gland there was necrosis of tissue and the rib had to be removed and transfer of the flap delayed

Figure 8d shows a plastic operation that was done to correct the sphincter like appearance of the right corner of the mouth The shaded area in the left hand figure was excised through the full thickness of the cheek, and the wound closed as shown in the right hand figure. Figure 8e shows the results

Gillies fect in of the e cartilage which makes a sharp angle was removed and the rib part was united to the freshened left end of the mental fragment while the sternal end of the cartilage was buried in a tunnel burrowed between the soft tissues and the external surface of the remaining part of the ramus This operation had to be performed in two steps After preparing the bed to receive the graft, to avoid using the great number of ligatures that would be needed partially to control the bleeding the wound was closed with 24 hour drainage and about a week later it was re-opened and the graft inserted.

Figure 8f The figure to the left shows the cartilage-bone graft replacing the right body of the mandible The cartilage is visible in the roentgenogram because of lime deposits When first seen it was thought that this might be due to the change of function but an X ray of the chest showed all cartilages similarly affected. Comparing the right figure of 8f with the right figure of 8a there seems at first glance to have been an apparent lengthening of the reconstructed body Careful comparison leads to the conclusion that this is an actual lengthening due to the ramus which was dragged forward at the time of operation gradually retreating to its normal position with a concurrent deposit of bone at the site of union, the mental fragment being fixed at the time by the splint The roentgenogram shows that the mental fragment has not materially changed its position Such a deposit of bone at the site of a mandibular fracture, when the fragments are gradually drawn apart by a traction splint has frequently been observed and quite large gaps have been made to fill in by this procedure

Figure 8g Front views of this patient which were taken to show the condition of the patient at the time of entering the reconstruction hospital and at the present time

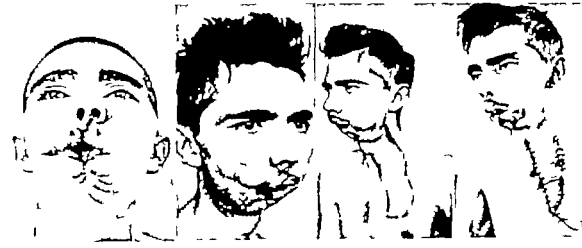


Fig 9a. Fig 9a. Fig. 9b Fig. 9b.



Fig. 9c

from the serious objections that have been raised against infiltration of tissues with the melted wax.

Figures 9a, 9b, 9c, 9d, 9e, 9f, 9g. Figure 9a. Photograph to the right shows a man in whom the right two thirds of the upper lip, the lower half of the right cheek, the greater part of the lower lip and chin, and all of the mandible in front of the second molar teeth were destroyed by a shell fragment. The first step in the reconstruction was to cut the ramus in two transversely on each side and slide the remaining part of the body and angle of each side as far forward as possible where they



Fig. 9d Fig. 9d Fig. 9e Fig. 9e



Fig. 9f Fig. 9f Fig. 9g

Figure 8h. Profile views of same patient. The scars resulting from the plastic operations have been excised and resutured. An inlay graft (Waldron type) was used to deepen the inferior dentolabial fornix. The chin has been rounded out with a deep injection of cold paraffin because the patient wished

were retained by a contrivance made by Captain Dameron. In this way about seven-eighths of an inch in the length of the body of the jaw was gained on each side. This procedure is shown in Figure 8a. The second step was to reconstruct the upper lip by cutting the flaps "A" and "B" through the full thickness of the cheek and after freeing the dis-



Fig. 10a. Fig 10a. Fig 10b Fig 10b.

Figure 9b To obtain material for the lower lip and chin including the mental part of the mandible the flap outlined in Figure 9b left photograph which include the head and 3 inches of the full thickness of the clavicle was raised up and sutured back in its bed-delayed transplantation This was done under novocaine. A subsequent bronchitis precluded transferring this flap and several months elapsed before the flap was again raised up and again re sutured in its bed preparatory to transfer This time the tip of the flap became gangrenous, as shown in the right photograph Ten days later the skin covering the chin area and the lower lip were split vertically in the mid line and a transverse in cision was made on the chin surface below (right hand picture Figure 9c) The resulting flaps were dissected laterally exposing the free ends of mandible on each side That on the left was shorter than on the right but in twisting the pedicle to throw the skin surface forward the head of the clavicle was brought in contact with the end of the shorter left mandible which compensated for its shortness and allowed the graft to lie transversely The chin and the right two-thirds of the lower lip external and

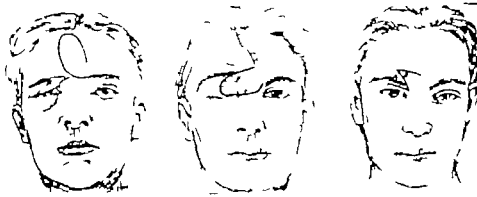


Fig 11a.

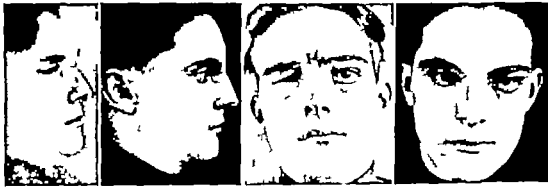


Fig 11b Fig 11b Fig 11c. Fig. 11c.

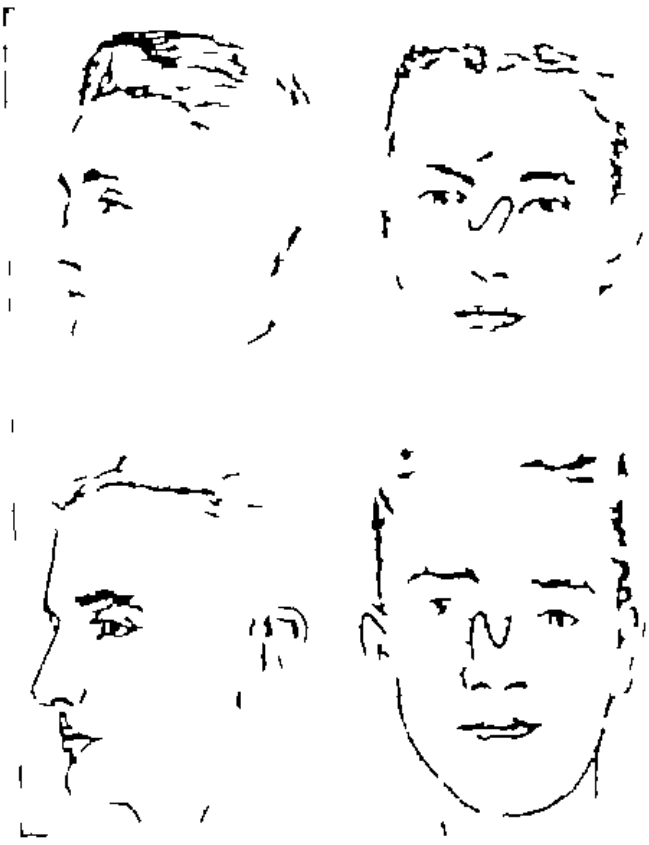


Fig 2a

internal surfaces, were reproduced in this way and by suturing the intra-oral skin to the freed sublingual mucosa the upper surface of the graft was entirely covered

sketches, Figure 9c.

Figure 9d shows the result of the plicting of the chest clavicle flap in the chin after the pedicle had been cut and returned to the neck It looked like a big flap when it was made but if it had been twice as broad the result would have been very much better

Figure 9e shows a front view of the condition on arrival at the reconstruction hospital and of the final condition after the point of the chin had been rounded out with a cartilage graft and making some adjustments of the lower lip

Figure 9f The right hand photograph shows side view of the case after the cartilage transplant was made The distance from the columella to the tip of the chin is greater than the ordinary formulæ for good facial balance calls for but this helps to neutralize the very prominent nose The full extent of the original deformity can not be appreciated from the left hand picture because it is not a true profile Later after the labio-alveolar fornix was reconstructed with a skin graft Captain

at a growth
re left side
of the jaw
f the head
of the clavicle was placed against the end of the body of the jaw so as to throw the graft as far forward as possible Note that the prominent border of the head of the clavicle has been absorbed all around except where in contact with the jaw and here the contact has been strengthened by a deposit of bone This is but another illustration of the truth and force of Lane's definition of bone "ossification in the lines of force"

Figures 10a and 10b An injury of which there were relatively few instances during the war was clipping out the root of the nose and unfortunately usually associated with the loss of one or both eyes



Fig 10b Fig. 10b Fig 10c Fig 10c

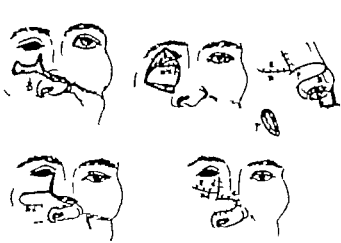


Fig 13a

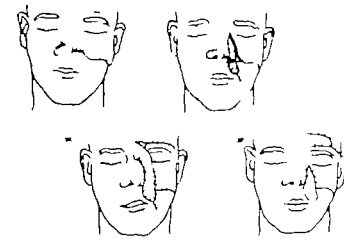


Fig 13c



Fig 13b. Fig 13b Fig 13d Fig 13g Fig 13g.



Fig 13e.



Fig 13f

In this case though both eyes are gone the lids are undamaged The correction consisted in first cutting out all scar which allowed the tissues to retract reproducing the original defect and then turning a flap from the forehead which was sutured in such a way as to restore the contour of the bridge

Figure 10b shows the result of operation in this case If the defect to be bridged was very large an osteoplastic flap was made of the periosteum and a strip of bone covering the frontal sinus and this was turned down on a hinge of periosteum and muscle so that what was the outer surface of the

frontal sinus permanent drainage was established and the operation continued After the bridge of bone is in place the covering flap of skin is turned down to cover it This flap may be made at the same time to repair an eyelid

Figures 11a 11b and 11c Figure 11a shows a case in which the nasal injury is combined with an injury of the upper eyelid The central figure

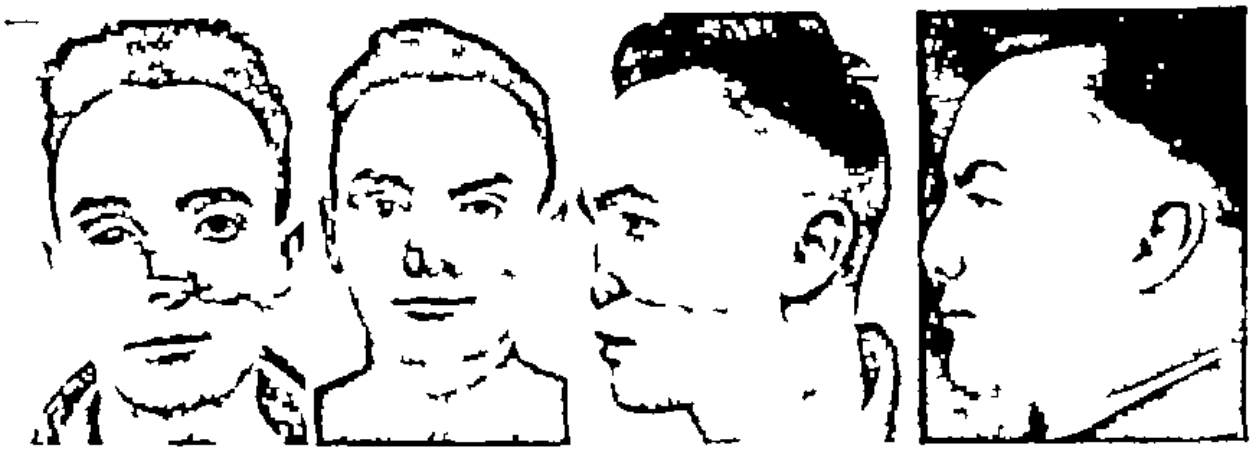


Fig 13b Fig 13h Fig 13i Fig 13j

shows the forehead flap turned into place and the forehead defect converted into a linear wound In placing this flap the inner end of the right eyelid was forced to an abnormally high position

with considerable laceration of the soft parts. The bone bridge was depressed and displaced laterally The upper left hand picture shows the lateral view while that to the right is a front view with the flaps for correction outlined on the

in the upper left figure represent the scar excision. The undermining beneath "F" was just beneath the skin while that under "A" and "D" was just superficial to the periosteum. After the flap "A" consisting of skin and superficial fascia was raised from its bed (lower left figure) the deep surface of the subjacent deep tissues was superimposed on the subcutaneous tissue under "b," as shown in the upper central figure thus partially filling the hollow below the socket approximating "D" to "E" and raising the right corner of the mouth Then the skin flaps "E" and "D" were sutured and the "A" flap placed between "C" and "B" as shown in the lower right figure Later the flattened nasal bones were chiseled free from the nasal processes of the maxillæ pried forward and

was raised the tip of the "A" flap was brought to the left so that it rested upon the lower boundary of the notch while the "B" flap was switched to the right to take the place of the "A" flap, as shown in the lower right right hand figures.

Figures 13b and 13c show the case before the operation and the result of the operation It also shows a downward displacement of the inner canthus only partially corrected at this time The downward depression of the inner canthus in these cases where the scars go through the nasal and lachrymal bones consist in the removal of the lachrymal sac and cutting a tongue-shaped flap from the upper eyelid base on the root of the nose and switching it into an incision made transversely just below the canthus after the canthus has been moved up to its proper position

Figures 13a 13b 13c 13d 13e 13f 13g 13h 13i Figure 13a are drawings of the right side of a face that was very much damaged by shell The damage to the nose is shown in this and in subsequent figures, but the depression and loss of bone below the right eye socket does not show The shaded areas

"B" was raised and sutured raw surface out into the defect in the left side of the nose after the scar was removed. It was then covered by the

reduced by subcutaneous excisions and by the operations shown in Fig 13e the crease between the ala and cheek was reproduced It was further deepened

(Thiersch

pendent

was corre ing a flap from the temple

13g a stage in the progress of the case

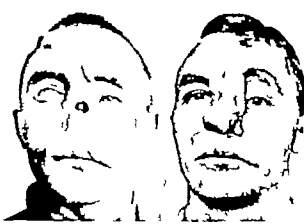


Fig 14a 1 Fig 14c

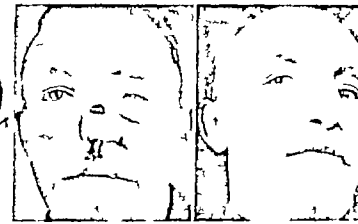


Fig 14e. Fig 14c

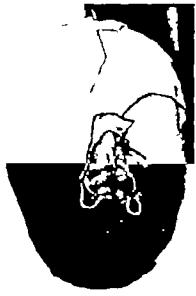


Fig 14a 2



Fig 14b



Fig 14d.



Fig. 14f Fig 14f. Fig 14g. Fig 14g.

Figures 13h and 13i show the front and profile view as they were on entering the hospital and as they appeared near the completion of the case The stare that remains about the right eye is due to poor action of the upper lid dependent on a badly fitting artificial eye Note that the relation of the margin of the lower lid to the iris is about the same in each eye The full extent of the original deformity cannot be gaged from Figure 13i because it is not a true profile The true profile position to the ordinary photographer of commerce is like the giraffe to the farmer There ain t no such animal On the other hand Miss Hance has by the skillful use of lights entirely eliminated the cheek scar which though not depressed still shows on the man

Figures 14a 14b 14c 14d 14e 14f and 14g Figure 14a shows a soldier who had extensive destruction of the nose and left maxilla with a downward slump of the left lip cheek palpebral fissure, and eyeball The cartilage on the forehead had previously been implanted for the purpose of making the nasal bridge This cartilage was not used however and was later removed The first steps of the final plan of reconstruction are shown in Figure 14a 2 On a plaster cast of the patient a clay nose has been modeled. From this clay nose a tinfoil pattern was made which later was used to outline the flap on the forehead

double fold in the center is the future columella and septum while the surfaces on either side of this represent the skin lining of the nostrils The main part of the flap has its skin surface away from you and part of the raw surface is exposed This uncovered area will be applied to the raw surface of the trap-door flap to be turned downward from between the eyebrows The dotted line on the folded tinfoil pattern is to indicate the actual length of the future nose The extra amount of the flap below this will be required to make the fold that will constitute the edge of the nostrils

Figure 14 shows appearance when this flap was first turned down into place Notice that on his left side an attempt was made to utilize a part of the original ala This was a great mistake and necessitated the series of operations shown in Figure 14d and the resulting irregularities have never been entirely smoothed out. It is often better to eliminate a distorted ala and make an entire new one

Figure 14e The photograph to the left shows an almost front view of patient as he came to the reconstruction hospital The picture to the right shows result of implanting costal cartilage and shaping up the flap Note that the left eye is still lower than the right The slump of the left upper lip and depression of the eyebrow and palpebral fissure have been partially corrected by plastics skin graft and cartilage implant but this point is still being worked upon.

Figure 14f is a side view from the left of condition on entering reconstruction hospital and also at the present time Note scars from operations on reconstructed ala

Figure 14g Corresponding views from the right Note that the upper lip has been raised and given a better shape by turning in part of the original skin of the nose to extend the floor of the nares forward Note also the columella and the new ala.

treatments during 2 years without any apparent effect toward healing. He remained in the hospital for 1 month and was discharged (on request) unhealed Readmitted in 1915 with lesion showing destruction of skin and subcuticular tissues over entire penis and extending over upper portions of scrotum, into groins and suprapubically Received active antiluetic treatment and 8 X-ray exposures. Diagnosed tuberculosis cutis and discharged 7 months later still unhealed. Readmitted in 1916 Penis almost completely destroyed and scrotum markedly swollen " "
worse. "
charged "
lieved.
Ulceration extending over right inguinal region and upper portions of scrotum. Received 18 X-ray exposures and discharged 10 months later

NOTE.—Patient known to be at present an inmate of the penitentiary which he entered on June 29, 1920 Investigation found him to be in about the same condition as at the time of his fourth hospital admission as revealed in the picture taken at the time of his confinement. July 20, 1920 Wassermann test, negative. August 20, 1921 following letter received from Dr H. Phillips, resident physician, Eastern Penitentiary Philadelphia, Pennsylvania "In accordance with your request we submit below data on C. B a prisoner now confined in the above institution. On May 5 1921 we commenced intravenous treatment Injection 5 cubic centimeters, 1 per cent tartar emetic gradually increasing dose until 10 cubic centimeters was given in each injection. These injections were given every other day for a period of 2 months. After 2 months the treatment was cut down to one injection weekly After ten treatments were administered he began to heal very rapidly and was entirely healed after being under treatment for a month and a half Following is list of treatments as given May 5 7 9 11 13 15 17 19, 21
2 " " " " " " " "

positive for granuloma bodies, cultures, positive for Friedlaender-like bacillus.

Histopathology Section from margin of granuloma, fixed and stained as others. Structure typical of granuloma. Large preponderance of endothelial cells. Considerable proliferation of aquamous epithelium. Coccoid forms seen in some large mononuclear cells.

HYDATID CYSTS OF THE PANCREAS[1]

BY MANUEL ALBO M.D., F.A.C.S., MONTEVIDEO URUGUAY

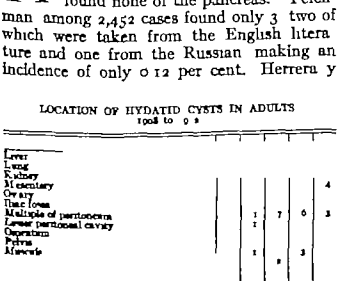
On connait peu les maladies du pancreas on ne les recherche pas (*Arnozan*)

HYDATID disease of the pancreas is a rare affection Meisser in 983 cases found none of the pancreas. Feich man among 2,452 cases found only 3 two of which were taken from the English literature and one from the Russian making an incidence of only 0 12 per cent. Herrera y Vegna and Cramwell, in 970 cases from 1875 to 1900 mention none of pancreatic localization Graglietto gives an incidence of 0 12 per 100 as compared with 42 per 100 in the liver

In 375 cases from the statistics of the hospitals of Montevideo from 1908 to 1912 there were no cases of pancreatic involvement.

Pena gives the following statistics in 150 cases operated upon in the Children's Clinic

LOCATION OF HYDATID CYSTS IN ADULTS
1908 to 0 8



STATISTICS OF THE PREYRA RUSSELL HOSPITAL
1908 to 913

Age	3	4	5	6	7	8	9	10	11		13	14	
Location													
Liver only		4	1	4	17	3	7	9		10	6	1	75
Liver and peritoneal cavity													3
Liver and omentum				3		1			1	3			9
Liver and right lung													1
Liver and spleen					1	1	1		3	1		3	7
Lung									1	1			7
Peritoneal cavity							1		1	3	1		6
Brain					1				1	1			1
Neck									7	17		5	10
Total		4	1	1	20	5							

[1] Translation through the kindness of W. R. Meeker M.D., Rochester Minnesota.

from 1896 to 1913 125 of which were operated upon by himself

Cysts of the liver	100
Cysts of the lung	10
Retrovesical cysts	5
Cysts of the kidney	5
Cysts of the cerebrum	3
Cysts of the spleen	2
Cysts of the neck	2

ETIOLOGY AND PATHOLOGY

Hydatidosis is an affection caused by the taenia echinococcus[1] The affection is prevalent in countries in which man lives in contact with the dog Iceland may be mentioned particularly It also is prevalent in grazing countries and the number of cases seems to increase the longer the cattle raising industry is established It is thus an important affection in many sections of South America Cramwell and Herrera Vegas say Hydatid cysts were unknown among us until 1870 and it is only from 1890 that they began to be observed with certain frequence but in the last 10 years they have increased in such an alarming manner that the government has been forced to consider means of combating the disease

DESCRIPTION

The head of the taenia echinococcus measures no more than one-third of a millimeter in breadth is provided with four suckers and a projecting rostellum in which are inserted hooklets of variable dimensions and number Generally 28 to 50 may be counted The neck is very short and the body consists of three or four segments at the most the last segment measuring near 2 millimeters in length and 0 5 millimeters in breadth The total length is 2 5 to 5 millimeters being one of the smallest species known

LARVA

The larvæ are the hydatids or echinococcus (echinococcus polymorphus) They develop in a great number of herbivora particularly in the sheep and less often in carnivora, in the liver lungs, and different organs They are frequently observed in man in which they produce what is called hydatid cysts The cyst is formed by the tissues of the host surrounding the hydatid in a parasitic manner

EVOLUTION

The ovum measures 30 to 36μ in diameter and contains a dormant embryo Ingested by a sheep or man it changes to a vesicle (hydatid) with a wall composed of an external laminated cuticle and an internal germinative or parenchymatous layer This membrane gives rise to brood capsules from which scolices are developed A single ovum may thus give rise to hundreds of adult worms

The scolices retained by a fragile peduncle may become detached but are more often invaginated They frequently disinvaginate and the hooklets return to the exterior As they perish they fall into the liquid of the broad capsule The wall of a cyst may become thin and rupture thus discharging heads or hooklets of taenia echinococcus free in the cystic liquid These may be detected by microscopic examination after puncture of a cyst.

When a part of the germinative membrane is surrounded by a cuticular lamina, small vesicles are formed which travel toward the exterior as the result of continuous formation of an internal stratum of cuticle These daughter cysts have the same development as the original and according as they fall by rupture of the cuticular membrane into the mother cyst or outside of it there may arise endogenous or exogenous daughter cysts.

In all the cases the endogenous daughter cysts differ from the parenchymatous cysts in that the first presents always a stratified cuticle while the endogenous present none at all Daughter cysts may in turn produce grand-daughter cysts In certain cases there may be arrest of development of hydatids, the cyst continuing to grow in size but there are no corresponding production of heads This produces an acephalic cyst The hydatid liquid is very toxic

The third segment has a perfectly developed reproductive apparatus and contains in its interior no less than 500 ova (*Parasitologie*

[1] Taenia Echinococcus—Eschricht, 1853 (Type, varieties, class, phylum, species, order, suborder, family — genus, group, taenia hydatids or cysticus of Leuckart)

deposited upon vegetables which are eaten by animals and man They may remain in water which is used for drinking purposes and thus may be consumed directly

The ova may also be directly transmitted in other ways The intimacy of men and dogs in many localities is well known, as for example in Uruguay Here the dog forms an integral part of the family, living in the same habitations eating from the same plates, constituting for the rustic herdsman his most faithful friend and in the end really his most terrible enemy The herdsman feeds the dog with the same fork with which he himself eats, often sharing mouthfuls equally It is clear then that the dog may infect the man directly if we bear in mind that numerous ova of tænia echinococcus remain adherent to the hairs of the anal region after defæcation and that the dog licks this region frequently in his habits of cleanliness

The ova once introduced into the digestive apparatus reach the stomach and are mixed with the gastric juice This dissolves the investing membrane in 4 or 5 hours, according to Leukart, who fed ova to rabbits The embryo itself is in consequence liberated and mixed with the stomach contents It is then carried to the duodenum where it makes use of the hooklets with which it is provided, attaching itself to the intestinal mucosa and finally opening up a passage for itself through the intestinal coats From here it may localize in different regions of the body, preferably in the liver

What is the route which the embryo follows in this last passage before implanting itself definitely in the organs of the body? In the majority of cases the liberated embryo after having passed through the intestinal walls penetrates to the capillaries and is carried by the portal circulation to the liver where it anchors and gives rise to the most common of hydatid cysts. Leukart's observations have proved many times the existence of embryos in the blood of the portal vein of rabbits infected with ova of tænia echinococcus

The mode of transmission may also be the portocaval system or by way of the hæmorrhoidal veins which according to some authors is the most frequent.

This manner of infection is certainly the most common and explains why the cysts localize preferably in the liver

Some authorities are supporters of a direct migration and maintain that the embryos of the intestinal walls pass by means of the lacteals to the lymphatic channels and thoracic duct. They are thus emptied into the venous system making their way to the right heart, pulmonary artery and lung either anchoring here or being disseminated to other organs "This manner of infection must, however not be very frequent as it would not explain why hydatid cysts are so much more common in the liver than in the lung' (P Belou)

Contagion by inhalation of dust particles in which dessicated ova of tænia echinococcus may be present is cited by certain Australian physicians (Bird) By this means ova might lodge in the lung and be disseminated from here by vascular embolism We think this method may be disregarded except for the possibility of contaminating the digestive tract by aspiration of respiratory secretions

The digestive tract must be admitted the most frequent route of entrance with intermediary of the blood stream for localization in the pancreas It may be supposed that because of the anatomic characteristics of the gland having its excretory ducts in connection with the duodenum there might be a direct migration from the duodenum This method has been supported by Hauser who regards the contamination of the portal system as the less rational method

With regard to this hypothesis of Hauser we may repeat Devé's assertions concerning the migration of the liberated embryo from the intestinal tract to the liver He maintains that the passage can be directly across the peritoneum or indirectly at the expense of subperitoneal tissue but that the most probable hypothesis is that the portal vein constitutes the great avenue of entrance of the hydatid parasite to the liver and in a general way to the entire organism

Exceptionally, he says that a certain quantity of embryos may be carried to the liver by the arterial route, as for example by the cœliac trunk in the case of an echinococcus

septicemia following the massive infection of the blood stream by rupture of a cyst. Although the development of the liberated embryo has not been studied experimentally for the pancreas we must deduce from the probable origin that it would not be in the interior of the glandular acini but in the periacinar vascular network in which the parasite would most likely be detained. During its progressive growth the encasing cuticle is developed as the result of a local reaction in which the surrounding vascular tissue and migratory elements participate the parenchymatous cells disappearing entirely as the result of toxic necrosis and mechanical pressure in the region of the parasite (Devé loc cit.) The permeability of the glandular duct is however conserved as the duct epithelium persists in spite of compression. This would indicate that glandular function would be restored with removal of the parasitic process.

In which direction do cysts of the pancreas usually develop? In the direction in which they encounter least resistance, and in this way the cyst may project into the lesser omentum below the transverse mesocolon

of greatest growth of the cyst does not indicate a superficial location in the pancreatic parenchyma at that point, as the gland itself may be pushed forward by the growing cyst.

PATHOLOGICAL ANATOMY

The development of the parasite within the gland provokes reaction in the surrounding tissue resulting in the formation of a fibrous envelop usually of finer texture than that which develops in the lung and liver. There are according to Chutro no signs of sclerosis or congestion of glandular tissue to microscopic examination. Even though such changes might be produced they are certainly not marked so that no deficit of glandular function is felt except in those cases in which there is compression of the ducts. On the other hand when the tumor is implanted in the gland in a superficial position its position becomes subserous and the vascularity of the omenta and mesenteries is increased often to an extent that would make its extirpation seem dangerous to most surgeons. There is often retraction of the lesser omentum and adhesions to the stomach colon and liver. Adhesions to the abdominal wall are found only in the last stages of development.

Cysts developing in the cervicocorporeal portion of the pancreas usually have one of three points of prominence (1) across the lesser omentum (2) across the gastrocolic ligament, (3) across the transverse mesocolon.

Cysts developing in the tail of the pancreas, usually force forward the stomach and sometimes the transverse colon and often appear at first sight to be below the kidney.

The hydatid cyst continues growing until evident tumefaction is produced in most cases. In other cases the phenomena of canalicular compression (Wirsung and Santorini) play a more important part. These trains of symptoms are largely dependent upon the position. Hydatids situated in the head of the pancreas and in front of the ducts cause compression very late while those located within the ducts or behind the duct of Wirsung produce phenomena of compression very early.

COMPLICATIONS

Suppuration has been shown in some observations. Biliary and pancreatic retention with the resulting complex of symptoms may be admitted as the rule with certain cysts. Spontaneous rupture has not been observed. There have been no cases of rupture into the digestive tract reported in the literature.

SYMPTOMATOLOGY

We divide hydatid cysts of the pancreas into three groups according to the pathological anatomy as follows:

1. Those which develop in a latent or almost latent manner so that they give a symptomatology of palpable or appreciable tumor.
2. Those which develop rapidly producing symptoms resembling those of cancer of the bile ducts or head of the pancreas.
3. Those that produce symptoms resembling those of retroperitoneal tumors.

Those developing in a latent manner with symptomatology of palpable tumor usually produce the same symptom as those of blood cysts of the pancreas There may be light pains in the epigastrium from irritation of the cœliac plexus, due to the size of the tumor rather than the cystic formation *per se* The oppression in the epigastrium may at times be of a spasmodic form due to the same cause There may be accompany ing inaptitude, nausea, and vomiting Intestinal symptoms may be constipation from compression of the colon, a viscid diarrhœa called "flux," a greasy diarrhœa signifying pancreatic insufficiency which would be in relation to the extent of glandular destruc tion Pancreatic salivation is exceedingly rare (Ludolph and Zielstorff) but it should be kept in mind The slow pulse would seem to be dependent upon a vagal stimula tion Cachexia is far from frequent (func tional deficit) the same as the diabetic syn drome There is often a transmitted pulse

We were not acquainted with Navarro's sign (dimunition in the number of pulsations by compression of the pancreatic area) when these patients came under observation so that we did not look for it. The phenomena of compression of the duodenal arc may pro duce the syndrome of chronic obstruction in this organ with its symptom-complex (vom iting malnutrition), and it is possible that it may have passed unappreciated in the greater part of the cases operated upon, this syndrome being attributed to mechanical reflexes The tumor is often perceptible to inspection appearing in the epigastrium when located in the head in the same region or nearer the umbilicus when located in the body and in the hypochondrium and flank when located in the tail. The point of greatest prominence is vari able, but these tumors follow in general the scheme of Korté and Mayo-Robson already mentioned under pathological anatomy

Cysts of the head of the pancreas, simu lating a cancer of the bile ducts or head of the pancreas, give the following symptoms (1) general emaciation (2) bronze color of the skin, (3) icterus most always persistent and progressive with a dilated gall bladder (Courvoisier Terrier law), with the accom panying discoloration of the fæces, and icteric tinted skin mucosæ, and urine, (4) pain in the pancreatic area, (5) aversion to fats and oils, (6) pain radiated to the back and left lumbar region, (7) tumefaction not always palpable even in cachectic subjects (as in one of our cases)

Cysts which develop as retroperitoneal tumors are usually without symptoms except the pain and marked tumefaction when it exists features which have caused confusion with tumors of the kidney and adrenal.

DIAGNOSIS

Is tumor present? If the answer is affirma tive, is it of the pancreas? The question is settled in the following manner

Determine first whether the tumor is parietal or intra abdominal Augagneur has stated that in dealing with an abdominal tumor the first step should be the elimination of tumors of the abdominal wall Palpation is usually sufficient to do this A number of diagnostic procedures, however enable one to decide this point with certainty If the tumor is mobile or relatively so but becomes fixed when the patient contracts the abdomi nal muscles it indicates that the tumor is of the abdominal wall (elevation of the head)

Tillaux preferred the following procedure The most prominent point of the tumor is marked with a dermographic pencil, and the patient is instructed to inhale and exhale using force in the procedure If the tumor is of the abdominal wall the most prominent part of the tumor and the skin marking remain in the same relation to each other, on the other hand if the tumor is intra abdominal the relations change

To determine whether the tumor is intra peritoneal or retroperitoneal the same author reasons as follows Intraperitoneal tumors usually displace the intestinal loops coming in contact with the abdominal wall. The retroperitoneal ones are usually covered by loops of intestine, stomach or colon, so that resonance in front of the tumor will be path ognomonic of retroperitoneal tumors and vice versa, according to Spencer Wells. Then it has been established that the tumor is retro peritoneal, it remains to determine whether

the tumor developed from the kidney the mesentery or the pancreas. If from the mesentery as a rule it has a median location umbilical, with intestinal loops in front and immobile laterally. If from the kidney the location will not be median but lateral and covered by colon it usually gives increased lumbar dullness and is immobile transversely. If from the pancreas, its location will be median except when located in the tail. It is almost, but not entirely immobile. Le Dentu has assigned great value to a hydro-aerial sound perceived in front of the tumor really a sign of little value if we remember the possibility of spontaneous hydropneumatic cysts or those arising from communication with a hollow viscus. More value should be accorded the method of Minkowsky and Nauyn which consists of the following: (1) accurate determination of the site of the tumor; (2) gaseous distention of the stomach with citric acid and sodium bicarbonate with a new observation of the tumor which should have been displaced downward; (3) the gas is next released from the stomach by means of a Faucher's sound; (4) an intestinal enema of 2 liters of water is given noting the new displacement of the tumor somewhat upward.

If, as Chutro believes, it is possible to diagnose hydatid disease of the pancreas, we must admit that the diagnosis without doubt carries a high percentage of error in view of the rarity of the affection. There is neither an eosinophilia nor deviation of complement (Bordet, Geangou, Wassermann reaction) as constant findings to aid in the diagnosis. The resumé of cases to date with the exception of those of Chutro shows that diagnosis has not been made except at operation or autopsy. The symptoms cited by Chutro are not peculiar to this affection but are common to any tumor of the head of the pancreas. We give herewith the basis of diagnosis formulated by this author:

1. Spontaneous pain in the abdomen near the umbilicus and a sense of pressure following a transverse direction in the epigastrium and extending to the hypochondrium.

2. Gastric disturbances of reflex origin from compression without any organic lesion to account for the symptoms.

3. Obstructive icterus which is not modified during a year by medical management.

4. An enlarged gall bladder which would indicate a tumor at the head of the pancreas (Courvoisier and Terrier).

5. Aversion for fats and above all the elimination of all fatty substances without having undergone any digestive changes.

6. Rapid and pronounced emaciation with great loss of strength.

7. The finding of a deeply situated tumor behind the stomach globular and smooth and in the region of the head of the pancreas.

8. Completely benign character and gradual development.

9. History of individual residing or having recently come from a country in which echinococcus disease is common.

10. The fact that cysts of the inferior surface of the liver often give signs of compression of the bile ducts, but rarely of the duct of Wirsung.

11. No deformity of liver.

[illegible]

of the lower surface of the liver and tumors of the spleen and kidney distinguishing features of which have already been mentioned. Important points are the relation to respiratory movements and location with respect to the stomach and colon. Radiography is also important in diagnosis, a previous pneumoperitoneum often permitting identification of the pancreas.

TREATMENT

No satisfactory antiparasitic drug is known. 606 and 914 which have been recommended by some authorities seem to possess no particular value.

tion of the tumor is not always easy. In our case in which the greater amount of glandular parenchyma was in front of the cyst, the

impression from palpating the tumor was that of a growth situated at the head of the pancreas The site of implantation is not always easy to discover when the tumor projects markedly across the lesser or greater omentum or the transverse mesocolon It is stated that many hydatid cysts of the pancreas are not recognized as such, and that they are merely conceded reactions due to proximity to the pancreas (bordering the gastrocolic omentum, spleen and so forth) On the basis of location it is convenient to divide them into intraparenchymatous and subserous cysts with sessile implantation Removal of the tail of the pancreas through the gastrocolic omentum (Lardenois and Okinczick) may have its indications Mobilization of the head of the pancreas (Wiart Sencertt) is suitable for all cysts of the head which permit their delivery such as those which are situated on the posterior portion of the pancreas and those projecting anteriorly An ample protection of the peritoneum must be afforded in view of a possible dissemination of hydatids.

Extirpation of the tumor is usually not advisable This was tried in Graglietto's case, but it is not certain whether this tumor was of true pancreatic implantation It was a case of pedunculated hydatid whose origin was not certainly pancreatic. With cysts of true glandular implantation extirpations have been practiced only on a part of the pericystic tissue.

Evacuating puncture with the appropriate trocar (Potain trocar for small cysts and the ordinary ovarian cyst trocar for those of great volume) should be followed by the injection of parasiticidal liquid We employ a solution of pure formaldehyde 2 per cent in water or the injection of pure formaldehyde with a Pravaz needle and syringe in a quantity proportional to the volume of the cyst. After the proligerous membrane and daughter cysts have been removed, one should proceed to dry the cavity with gauzes soaked in ether containing some antiseptic substance after the method of Devé Should the cavity be closed, or drainage practiced? In our experience, it is best to close the cysts if the content is clear, unless the cyst is very large or in case it is necessary to resect the pericystic tissue followed by hæmostatic closure

To prevent a possible hydatid intoxication, which happens more frequently than most authors will admit, we inject 1 cubic centimeter of 1 1000 synthetic adrenalin (Parke Davis and Co) during operation also during the following days if tachycardia and dyspnœa accompanied by oliguria persist. The action of this drug in the prevention shock has been well demonstrated in other abdominal operations. Professor Delbet first recommended its use many years ago

If marsupialization of the pericystic pouch is done it is an easy matter to drain by aspiration as would be done in pleural empyema. Discontinuous instillation of Carrel's fluid should be employed if the microbic conditions of the infection indicate it.

As complementary operations cholecystostomy may be indicated when icterus is very pronounced and there are indications for rapid drainage of bile There may be indications for gastro-enterostomy in cases of duodenal compression

The feature in which medical men should become especially interested is that of prophylaxis. This is especially difficult to practice in country districts where there is usually mediocre intelligence and general disregard of advice along scientific lines

A decrease in the number of dogs on the ranches is of aid The periodic administration of vermifuges such as calomel and kawa kawa to the dogs produces a condition of lowered contagion The incineration of the carcasses of sheep in which cysts are found, keeping dogs and hogs away from them should be practiced and especial care should be exercised in order that the water supply does not become contaminated Thorough cooking of all greens which may possibly be infected is recommended The exclusion of dogs from the living quarters of the family would greatly reduce the incidence of the disease, especially in children

CASES FROM THE LITERATURE

Cases autopsied The older cases are of but little importance and they are mentioned only in a general way without laying great stress upon their location and relations. Such cases as those cited

by Montaux and Portal seem to be cases of implantation external to the pancreas with which they were only in contact

Masveron (thesis upon multiple cysts of the abdomen, Paris, 1881) cites three cases Two were taken from Turner and Hunter and are of questionable location in contrast to one taken from Meissner which seemed to be an intraglandular cyst Engel refers to an autopsy of a case of multiple hydatidosis, brain, kidney and so forth in which there was also a preglandular pancreatic cyst The second case of Claessen was undoubtedly glandular and Seidel gives one of the tail of the pancreas

Thomas. Statistics of cases of echinococcus observed during 10 years, 1868 to 1877 shows only two of hydatid cysts of the pancreas

Nadashdin gives 0 3 per cent as the result of numerous statistics

The protocol of Hunter upon the necropsy may be taken as a model of precision and is given herewith

Carlos B age 61 caretaker of sheep in Hunter B (North of Mecklenburg) died August 15 1911 The patient entered the University Hospital, surgical service April 27 1911 complaining of urinary retention, cystitis and tumor (abuces?) of the prostate The illness had begun with intermittent fever and had continued from a carbuncle of the back The patient was transferred to the ophthalmological clinic on May 31 1911 because of an iritis While there the prostatic abscess must have perforated spontaneously On June 15 1911 after the iritis had cleared up he was again transferred to the surgical section While here a fluctuating abscess developed in the muscles of the left arm A pneumonia became associated with this A left pleural effusion was punctured twice showing a very septic and degenerating content His general condition grew progressively worse finally ending in death on August 15 1911 Interrelated with these symptoms were certain stomach complaints An examination of the stomach contents after a test

was no palpable epigastric tumor Clinical diag-

clinical findings No tumor of the stomach was found Anatomic diagnosis was as follows sepsis, septic tumor of the spleen bilateral perinephritic abscesses renal abscesses, cystitis, and prostatic abscess A pleural empyema was found on the inferior part of the left side with extensive pleural adhesions Hypostatic pneumonia on both sides Echinococcus cyst of the tail of the pancreas Staphylococcus pyogenes was cultivated from the blood and from the spleen The following extracts from the protocol are related more particularly to the pancreatic cyst.

Upon opening the abdominal cavity a pronounced distention was noted The veins of the greater omentum and left gastro epiploic vein were very prominent as from obstruction These phenomena were found to be due to the presence of a deep tumor not visible *in situ* but evident to palpation. The lesser peritoneal cavity was entered by incising the gastrocolic omentum From the posterior wall of this cavity the tumor was seen limited above by the stomach below by the transverse colon on the left by the spleen and gastrosplenic omentum, and on the right by the duodenum and liver The pancreas seemed to be divided but in the tail covered by peritoneum was the tumor While *in situ* it was plainly seen that the splenic vessels were intimately adherent to the tumor though not markedly distended The tumor itself reached to the hilus of the spleen to which it adhered by a ligament (pancreatic-splenic) The specimen was freed from its coverings and the organs surrounding it was removed The head and body of the pancreas showed no particular changes The relations with the duodenum were the same as *normal*. The

measured 11 centimeters and the remainder was tumor tissue It is, therefore easily established that the cyst was not adherent to a prolongation but

the visible termination of the pancreas and hilus of the spleen that which is ordinarily the situation of the tail of the pancreas

There was a progressive change from glandular

measures 6 by 9 centimeters, and is adherent laterally and superiorly to the pancreas The axis of the pancreas forms an angle of 120 degrees with

which two daughter cysts the size of cherries were recognized Sections show clearly that the sac is filled with daughter cysts of variable sizes, in part freely floating, and in part adherent in the form of clusters. The thickness of the cyst wall varies from 1 5 to 2 millimeters

The specimen was given to the Institute so that further pathological studies were not made.

In none of the other organs were hydatid cysts present. We are dealing in this case therefore with a solitary echinococcus unilocular cyst of the tail of the pancreas

OPERATIVE CASES

Author s personal case Sinforoso Barcia, an oriental age 23 single of Department Florida Villa Vieja entered Maciel Hospital April 1 1914

Three years ago he began to suffer pain in the right side of the abdomen The pain radiated to the shoulder and was accompanied by gastric disturbances which began with a marked aversion to fats later including certain other articles of diet such as milk. He had never vomited Constipation was present at this time and became more marked under a régime of soft diet. These disturbances continued for a year in which icterus appeared increasing progressively in intensity until the skin became an olive tint which persisted until the end It persisted for 2 years in spite of medical treatment and consultation There was a loss in weight of 20 to 30 kilos. Physical examination showed marked icterus of the skin mucous membranes, and sclerae with severe generalized *pruritis, apathy and bradycardia*. There was no temperature. The liver was somewhat enlarged but not tender and did not show any tumefaction The pancreaticobiliary zone of Desjardins was painful but there was no appreciable tumefaction at this site. There was increased frequency the urine being loaded with bile pigments. Fæces were entirely colorless. Urotropin Vichy water and milk were given Three days before operation he was given 2 grains of calcium chloride purged with calomel and lavage on each of the three days preceding operation

Operation Anæsthesia of pantopon and ether without incident. A Sprengel incision with abdominal exploration revealed a tumor in the upper abdomen and behind the stomach when the duodenum was lifted. The liver was a little enlarged darkly discolored with an enlarged gall bladder which to palpation, appeared to contain foreign bodies. The greatest dilatation was in the central part where there was a fibrous appearing zone.

Appendectomy aseptization of the stump with iodine and invagination.

To examine the tumor it was necessary to mobilize the doudenum. It was then possible to appreciate the fact that the tumor formed a part of the head of the pancreas. Puncture made across the parenchyma of the gland on the anterior aspect with a Pravast needle gave a clear watery liquid. Examining the posterior surface a prominent part of the cyst was found in contact with the duodenum. The cyst was punctured with a Potain, trocar and the cystic fluid evacuated The sac was further opened and the proligerous membrane which was about the size of an orange extirpated. The cystic cavity and regional peritoneum was washed with ether The fibrous capsule was sutured, cholecystostomy performed and the abdominal incision closed with catgut and silk in two layers.

Postoperative. In spite of the employment of stimulating injections of physiological saline and camphorated oil the pulse as well as the general condition did not improve As would be expected the gall bladder drainage gave an abundance of bile The temperature was 38°C the pulse between 120 and 130 per minute auscultation showed râles in both bases and there was a cough and difficult expectoration. The scant urine in the first few days increased to a liter or more later on Stitches were removed on the eighth day and the same night there was an evisceration of intestines through the wound as a consequence of the severe cough The intestines were restored and the abdominal wall sutured in one plane with silver wire Murphy drip was given the patient placed in the Fowler position and camphorated oil given The temperature continued high emaciation and general condition became worse and the patient died on the eighteenth day after operation Autopsy could not be obtained

Case of Dr Mondino (not reported)

Elcira *Chodio de Robaina, age 30 native of* Uruguay (Department of Maldonada) entered the sanitarium January 29 1920 Upon inspection a globular tumor about the size of a big orange was seen in the left flank. The tumor was deeply fluctuating to pressure. It was dull to percussion and the dullness was continuous with that of the liver There was a distinct resonance between this organ and the spleen which did not follow respiratory movements. Hydatid fremitus was not present. The general condition of the patient was excellent, complaining only of a pain in the back radiated to the lumbar region.

Clinical diagnosis. Hydatid cyst of the spleen

Operation On January 30 a pararectus incision was made reaching to the spleen After incising the external ligaments and peritoneum and entering the abdominal cavity it was noticed that the tumor was in contact with the spleen but that it was not a part of this organ being luxated some what toward the outside. It was thus seen that the tumor was within the lesser peritoneal cavity On incising the lesser omentum glandular tissue was encountered which was identified as pancreas. This was protected with compresses and the tumor punctured Scarcely had the needle penetrated some 5 millimeters when hydatid liquid was obtained and the entire cyst was emptied by aspiration The germinative membrane was incised and extracted followed by a discharge of yellowish fluid which was collected for further examination. A section of the glandular tissue was also removed for examination By digital palpation of the cavity the cyst was recognized as one of the tail of the pancreas, and that its position was intraglandular The cavity of the cyst was sutured and left in place.

On February 8 the patient was discharged completely recovered. A letter received 6 months later stated that a smaller tumor had recurred at the old site and later completely disappeared

Dr Pedro Chutro surgeon of the Teodora Alvarez Hospital Hydatid cyst of the pancreas.

Benjamin M age 36 entered the surgical service of the San Roque Hospital May 24, 1906 The family histo
had measle
turbances
ions, or alcoholism.

For a year he has enjoyed good health but in this period and without known cause he began to be bothered with repeated vomiting accompanied by acid eructations which usually occurred a short time after meals At the same time he had acute pains in the right hypochondrium irregularly intermittent and not radiating He consulted a physician and in spite of the treatment prescribed he grew worse He vomited bilious material of mornings and sometimes during the day

At the end of a month he began to notice an icteric tint to the sclerae and discoloration of the feces He was treated as a case of catarrhal jaundice but in 15 days he was so debilitated he could not leave his bed Icterus also increased in intensity the skin becoming a dark olive color The urine was almost green and the feces the color of plaster and very hard Pruritis was so intense he could not sleep

For 4 months he traveled from one hospital to another having tried several varieties of medical treatment, with no results He continued to lose rapidly in weight and assimilation of food was almost nil At this point is recounted a feature of great diagnostic importance

He stated that he was ordered to take 100 grams of olive oil daily which he did for 3 months At times the oil was eliminated in the feces in the same condition as it was when ingested without having undergone any transformation whatever More frequently it was excreted in the form of globules of
greenish yel
and breakin
the oily cor
respects the capsules of castor oil now in current use

After a long period in bed in dorsal decubitus posture his digestive troubles improved His feces became somewhat colored and the intensity of the icterus diminished although it never entirely disappeared whether in bed or up and about All symptoms recurred later and were accentuated This led many diagnosticians to believe that the patient had a calculus with a certain amount of mobility and lodged in the common bile duct

The patient had also a degree of neurasthenia and having tired of medical treatment insisted that he be operated upon at once Temperature 37.5°C Pulse regular somewhat tense and rather frequent, 98 per minute.

Patient was a young man, well developed, but emaciated and wasted An icteric tint was very marked on the mucous membranes and skin, the latter showing erosions produced by scratching because of the intense pruritis The left side of the thorax was normal On the right side there was a moderate levation in tone Auscultation revealed the presence of a few rales at the lower The hepatopulmonary boundary came to the fourth rib and presented no irregularity On the right side the inferior part of the thorax was more voluminous The greater elevation of the costal margin and bulging of the intercostal spaces was clearly perceived

The liver was 8 centimeters below the costal margin It was uniformly enlarged conforming to the normal configuration of the liver The margins were short regular and distinctly palpable. It was somewhat tender to pressure and followed the respiratory movement In the incisura of the liver also in apposition with the inferior surface of the liver was a tumor the size of an orange globular smooth somewhat movable painless and soft in consistency which together with the location was thought to be a distended gall bladder To palpation it gave the sensation of a rubber ball and it could be distinguished as independent of the right kidney the inferior pole of which it touched To digital palpation of the right epigastrium the impression of a tumor was obtained the limits of

region but deep percussion demonstrated a zone of dullness in the center surrounded by a tympanitic zone The dullness was located in the epigastrium and was independent of the liver from which

was evident to palpation before It now seemed a little independent of the liver was somewhat movable but independent of respiratory

concluded that a tumor was present which from its evolution and character should be a hydatid cyst compressing the ampulla of Vater and the

sion, and the organ had dilated to a point four or five times the normal size It evacuated its contents slowly by external pressure Upon examina

tion of the biliary passages attention was called to the retraction of the gastrohepatic omentum and the presence of a tumor behind the duodenum in the lesser omental cavity independent of the liver A small puncture yielded clear watery liquid. The gall bladder was so greatly distended that it was a great obstacle to work in this region so that instead of making an evacuating puncture and then mobilizing the intestine to reach the tumor we preferred to approach it in another manner We therefore temporarily abandoned the first incision and made a median supra umbilical laparotomy incision Behind the gastrohepatic omentum the tumor was recognized It had developed in the head of the pancreas It was incised with a bistoury letting escape more than a liter of hydatid fluid in which were countless daughter cysts. The membranes were extracted and the cyst cleaned as well as possible As the cyst walls were very thin and impossible to bring to the border of the wound for marsupialization drainage was performed by means of gauze and a glass tube packing the cavity to the bottom, passing between stomach and liver The first laparotomy wound was closed in three layers In the second a space for drainage had to be left open Hypodermoclysis of a liter of saline was given. During night patient complained of great pain but the following two days were passed uneventfully

During the night of May 28 he had the first bowel movement of colored feces thus demonstrating the patency of the pancreaticobiliary passages. He seemed markedly improved upon removing gauze pack a quantity of daughter cysts were discharged June 1 daughter cysts were being discharged daily Feces were well colored The intense coloring of the skin was gradually disappearing After having had no appetite for over a year the patient asked for food and was given meat and milk

June 4 a slight icteric tint was just discernible in the sclerae, while on the skin it was still marked The cyst continued reducing its capacity and day by day fewer daughter cysts were discharged Marked improvement in assimilation of food and nutrition and the general condition was daily improving All sutures were removed

July 2 all traces of icterus had disappeared

had gained 13 kilos in weight

In May 1908 he returned for observation with a small eventration which is common in marsupializations. The scar was excised and the abdomen closed in three layers. Viscera in perfect condition

Virgilio Grigietto Echinococcus cyst of head of pancreas. Clinica Chirurgica 1913 p 786

Antonia D age 36 married entered the surgical section July 31 1911 with diagnosis of abdominal tumor She had never been ill menstruation had been regular until 2½ months ago when it ceased She had had nine normal deliveries at term. During the past 3 months she had observed that the abdomen was increasing in size and she could palpate the tumor through the abdominal wall It did not cause her any pain or trouble of any sort She was worried only by the progressive increase in size of the abdomen The patient was a thin woman, poorly nourished and very pallid Temperature was normal pulse full and rhythmic rate 72 pulsations per minute Cardiac borders were normal tones were clear and lungs negative

The abdominal wall was flabby quite thin with diastasis of the recti muscles so that palpation of the abdominal organs was greatly facilitated There was visible peristalsis and peristaltic movements could also be palpated A tumor in the umbilical region was recognized spherical in shape smooth tense of an elastic consistence and about the size of the head of a foetus.

It could be moved in all directions and was independent of movements of respiration The stomach and intestines could be recognized as independent of the tumor Liver and spleen were in the normal position and not enlarged The uterus was freely mobile in the normal anteflexed position and of a size corresponding to the third month of pregnancy The right and left adnexa were palpable not adherent and free from contact with the tumor

The urine contained no albumin sugar or other

tal organs, spleen and intestines was that of a cyst of the mesentery

Under ether anaesthesia and with the assistance of Dr Davanzo the abdomen was opened with a longitudinal median incision As soon as the wound margins were separated a retroperitoneal tumor presented to view It was spherical, fluctuating very mobile but attached by a short pedicle The stomach and transverse colon were displaced upward The omentum was lifted and with it the transverse colon the mesentery was incised and with it the posterior parietal peritoneum when we came in direct contact with the tumor The blood vessels which presented were ligated the tumor was disengaged gently and cautiously from its abundant adhesions. The short pedicle was thus reached which united the tumor directly to the head of the pancreas Owing to the risks presented in working in a field presenting so many difficulties it was decided to resect the tumor with its pedicle and ligate the stump After the tumor was removed some white round vesicles full of clear liquid remained and were identified as echinococcus cysts These were carefully excised. The pedicle was fixed to the peritoneum and with it to the abdominal wall. A drainage tube was inserted as suppuration was present in the abdomen. The extir

30 centimeters. The tumor was perfectly smooth

Benjamin M age 26 entered the surgical service of the San Roque Hospital May 24 1906 The family history was unimportant In infancy patient had measles and transient gastro-intestinal disturbances. No history of syphilis, malaria tuberculosis, or alcoholism.

For a year he has enjoyed good health, but in this period and without known cause he began to be bothered with repeated vomiting accompanied by acid eructations which usually occurred a short time after meals At the same time he had acute pains in the right hypochondrium irregularly intermittent and not radiating He consulted a physician and in spite of the treatment prescribed he grew worse He vomited bilious material of mornings and sometimes during the day

At the end of a month he began to notice an icteric tint to the sclerae and discoloration of the faeces He was treated as a case of catarrhal jaundice but in 15 days he was so debilitated he could not leave his bed Icterus also increased in intensity the skin becoming a dark olive color The urine was almost green and the faeces the color of plaster and very hard Pruritus was so intense he could not sleep

For 4 months he traveled from one hospital to another having tried several varieties of medical treatment, with no results He continued to lose rapidly in weight, and assimilation of food was almost nil At this point is recounted a feature of great diagnostic importance

He stated that he was ordered to take 100 grams of olive oil daily which he did for 3 months At times the oil was eliminated in the faeces in the same condition as it was when ingested without having undergone any transformation whatever More frequently it was excreted in the form of globules of greenish yel and breakin the oily cor respects the capsules of castor oil now in current use

After a long period in bed in dorsal decubitus posture his digestive troubles improved. His faeces became somewhat colored and the intensity of the icterus diminished, although it never entirely disappeared whether in bed or up and about All symptoms recurred later and were accentuated This led many diagnosticians to believe that the patient had a calculus, with a certain amount of mobility and lodged in the common bile duct.

The patient had also a degree of neurasthenia and having tired of medical treatment insisted that he be operated upon at once Temperature 37 2 C. Pulse regular somewhat tense, and rather frequent, 98 per minute

Patient was a young man well developed, but emaciated and wasted An icteric tint was very marked on the mucous membranes and skin the latter showing erosions produced by scratching because of the intense pruritus The left side of the thorax was normal On the right side there was a moderate elevation in tone Auscultation revealed the presence of a few râles at the bases. The hepaticopulmonary boundary came to the fourth rib and presented no irregularity On the right side the inferior part of the thorax was more voluminous The greater elevation of the costal margin and bulging of the intercostal spaces was clearly perceived

The liver was 8 centimeters below the costal margin It was uniformly enlarged conforming to the normal configuration of the liver The margins were sharp regular and distinctly palpable It was somewhat tender to pressure and followed the respiratory movements In the incisura of the liver also in apposition with the inferior surface of the liver was a tumor the size of an orange globular smooth somewhat movable painless and soft in consistency which together with the location was thought to be a distended gall bladder To palpation it gave the sensation of a rubber ball and it could be distinguished as independent of the right kidney the inferior pole of which it touched. To digital palpation of the right epigastrium the impression of a tumor was obtained the limits of which it was impossible to estimate because of the tension of the abdominal wall but it did not appear larger than the size of a fist.

Superficial percussion gave resonance in all this region, but deep percussion demonstrated a zone of dullness in the center surrounded by a tympanitic zone The dullness was located in the epigastrium and was independent of the liver from which it was separated by a border of very clear resonance

Under anesthesia it was found that the tumor was entirely globular and about double the size of that which was evident to palpation before It now seemed a little independent of the liver was some

[illegible] On the basis of the above data we concluded that a tumor was present which from its evolution and character should be a hydatid cyst compressing the ampulla of Vater and the

surgical suture Incision was made somewhat to the right of the linea alba reaching from the costal margin to the level of the umbilicus. Opening the abdomen the liver was seen to be congested and greatly increased in size but not distorted in shape Externally the gall bladder appeared normal although the fluid contained was under great tension, and the organ had dilated to a point four or five times the normal size It evacuated its contents slowly by external pressure. Upon examina

tumor was recognized situated in the deeper part of the head of the pancreas. Puncture of the cyst showed the content of clear watery liquid The chitinous membrane was incised and extracted and the wound closed. Because of the danger of infection the wound was opened up on the third day followed by the discharge of pus. Fever gradually disappeared Icterus faded Patient recovered

Martin. (Clin. Chirurgica Greifswald Prof Bier) A servant, age 71 had been ill for 7 months. He complained of severe pains in the shoulders nausea and acid eructations pains in the stomach and vomiting of blood ever since the illness In April 1902 he vomited daily after eating showing evidences of obstruction. He was sensitive to pressure in the umbilical region and left side of the abdomen Stomach was negative to physical examination. The tongue was coated Below the stomach a resistant tumor was palpated which was deeply situated and yet reached to the anterior

abdominal cavity it was evident that the tumor was of the pancreas. It was about the size of a fist and upon opening it echinococcus cysts escaped As the pyloric walls appeared thickened and indurated a gastro-enterostomy was performed Recovery was uneventful. About 6 months later the abdominal pains and bad general condition returned. No resistance could be palpated in the depths however

Villar Villar operated upon a patient for hepatic

one of which was extirpated with a portion of splenic tissue and the other sutured to the abdominal wall A cyst about the size of a mandarin orange, was found in the pancreas As this cyst could not be extirpated the method of capitonnage of Delbet was tried. The patient was discharged on August 5 completely recovered.

Vonnescu. Patient, age 44, was admitted October 17 1904. He had an abdominal tumor almost the size of an orange between the epigastrium and right hypochondrium Lateral mobility of the tumor was quite marked. The tumor also moved vertically with the liver following respiratory movements. The general condition of the patient was bad. He was cachectic, icteric, and fats were eliminated in the feces without digestive change At operation on October 26 1904 a hydatid cyst of the head of the pancreas was found which had ruptured during manipulation. The germinative membrane was extracted the content of the cavity

Mokrowsky P E, age 25 employed as a clerk Patient was admitted September 17 1902 Complained of a tumor in the region of the stomach which had been present for about 2 years. In the beginning it was about the size of a walnut painless and disappearing with pressure. It was more easily palpated 2 hours after a meal A year later the patient could distinguish another tumor behind the original one This was also painless. In the last 4½ months he has had attacks of pain and evidences of obstruction. There has been no vomiting nor icterus at any time The upper abdomen is distended. On the left side below the costal margin a prominence is seen. A tumor is seen extending both to the right and left of the median line in the upper abdomen. It is spherical but contains accessory bulgings. It follows the movements of the diaphragm in respiration Palpation of the tumor is painless. There is a prominent bulging on the right which shows fluctuation. A similar prominence on the left side is dense and non-fluctuating Both prominences are of almost the same size about 6 to 7 centimeters in diameter They are not situated similarly with relation to the linea alba, the left bordering the linea alba, and the right being 4 centimeters outside. The percussion of the tumor gives a dull sound which merges with liver dullness. The area of splenic dullness is separated however by a tympanitic zone next to the tumor dullness. Diagnosis echinococcus cyst of liver

Operation September 26 1902 by Professor Bobroff The tumor appeared below the liver after incision of the overlying lesser omentum. Thus was exposed the duodenum which had been displaced to the right more toward the inferior border of the tumor It could be seen at this point that the tumor belonged to the head of the pancreas. The tumor was a little larger than the head of an infant of firm consistency and somewhat fluctuating

Upon opening the tumor a small amount of green, purulent material was first obtained soon followed by the discharge of a clear watery liquid in which were daughter cysts.

Ribera y Sans. A P a woman age 21 A diagnosis was first made of echinococcus cyst of the liver Later it was thought the tumor was of the epigastric region and united with the liver and spleen It was smooth spherical, and tensely distended Two years ago she was first troubled with pains in the right shoulder and compression of the tumor was painful. It later disappeared as symptoms of advanced cardiac disease progressed and finally terminated fatally Laparotomy January 23 1893 proved the tumor to be a cyst of the pancreas. The patient left the clinic on February 18 1893 completely recovered

Lejars. Patient was a woman, age 55, who for the past 12 years had observed a tumor in the left upper quadrant of the abdomen. There had been a gradual increase in size especially during the past 12 days, during which there had been fever and pain. Infection was greatly accentuated. At opera

partly incised and resected, the deeper margins being clearly identified as belonging to the pancreas The margins of the cavity were sutured to

marked Seven or 8 months later the abdomen began to enlarge Briggs found a tumor at operation which was identified as certainly growing from the pancreas Upon puncturing the cyst he obtained a dark colored liquid which contained remnants of hydatids The tumor was resistant smooth, and of the shape of a ball It was located in the epigas-

adhering to the greater omentum, transverse colon and stomach By means of these adhesions a median fibrous union of several inches in length was formed

The adhesions were separated and the tumor extracted together with the tail of the pancreas. Recovery was rapid and uneventful Patient re-

Mayo-Robson

It seems that Hauser's cases are not all genuine cysts of the pancreas, also that some are only incidental to hydatid cysts of other organs. Capelli reduces the statistics to 16 cases, 6 of which were verified at autopsy and he has added 1 case of his own Since his article other cases have appeared in the literature those of Verdelet, Phillips Muller Parlavecchino Threulart, Graglietto and that reported by Cardarelli and operated upon by d Antoni (Carozzi La Cirugia del Pancreas, Bologna 1919)

THE ICTERUS INDEX OF THE BLOOD SERUM

By H PETER MAUL, A B M D New York
From the Pathological Laboratory of the Lenox Hill Hospital

THE laboratory tests reported in this paper were undertaken with the object of ascertaining whether the determination of the icterus index of the blood serum gives a definite idea of the degree of jaundice and whether it can serve as a guide to the increase and decrease of jaundice during the progress of a disease

The color of the skin and sclera and tests for bile pigments in the urine are the means generally relied upon by clinicians to indicate the presence or absence of jaundice Inasmuch as these methods are at best rather crude a more delicate and accurate form of determining the presence and degree of so important a symptom appears most desirable Since the bile is carried through the blood stream before its elimination in the urine the estimation of the bile pigments in the blood serum should give definite information regarding the presence and intensity of icterus.

Muehlingradt[1] has recently described a method for determining bile pigments in the blood Briefly it consists of comparing blood plasma with a standard solution of bichromate of potash and diluting the plasma with physiological salt solution until its color approaches that of the standard The potassium bichromate solution (1 10,000) is approximately equivalent to the color of a non icteric plasma

I have modified this method using serum instead of plasma The technique is as follows

A solution of potassium bichromate 1 10 000 is used as a standard Five to 10 cubic centimeters of blood are obtained and the serum allowed to separate The serum is compared in a colorimeter (Duboscq) with the standard bichromate solution The standard may be set at 10 15 or 20 millimeters The icterus index is obtained by

Muehlingradt Deutsch Arch f klin Med 91 cxxvii, 1

dividing the reading of the standard by the reading of the unknown When the color of the serum is too dark and cannot be compared with the standard solution the serum is diluted with physiological salt solution, until its color approaches that of the standard The calculation is as follows

$$\frac{R_x}{R_s} D = \text{Icterus index}$$

R_x = Reading of unknown

R_s = Reading of standard

D = Dilution

Normal icterus index In the 156 cases giving no clinical evidence of jaundice the lowest value obtained was 1 6 (No 4183 fracture of skull) while the highest was 12 (No 3757 pernicious anæmia) the average being 3 6 Eleven cases showed a higher figure than 5 but less than 11 these were classified as follows carbuncle of neck 4 cases of post operative hernia cardionephritis hæmorrhoids, pernicious anæmia and a subacute appendicitis One hundred and forty four cases varied between 2 5 and 5 An icterus index varying between 2 5 and 6 may be considered as normal

It is of interest to note that the cases of pernicious anæmia with one exception were within normal limits notwithstanding the fact that all these patients had an icteric hue

Icterus index in jaundice The table shows the icterus index in 15 cases with jaundice The values vary from 15 to 210 While the initial icterus index only is given in the table many subsequent determinations showed that the gradual disappearance of the jaundice was accompanied by a decrease in the icterus index The following cases illustrate the delicacy of the reaction

Case No 6138, toxæmia of pregnancy with acute yellow atrophy The patient was admitted on October 12 1921 intensely jaundiced The icterus index was determined on the 13th and was found to be 187 The urine showed a marked bile reaction and also leucin and tyrosin crystals On October 21 the icterus index had decreased to 62 the patient still being considerably jaundiced On October 25 the icterus index was further reduced to 31 the color of the skin was somewhat lighter than before and the urine still showed the presence of bile On October 31 the icterus index was 23 and on November 11 it was 14 Between October 13 when the index was 187 and October 21 when it

ICTERUS INDEX IN FIFTEEN CASES

Case No	History	Icterus Index	Diagnosis	Remarks
4		128 8	Acute catarrhal jaundice	6 weeks duration Recovered
5		15 8	Chronic catarrhal jaundice	At times skin slightly colored Recovered
46	3205	1	Acute hepatitis	Intense jaundice Not improved
90	3230	56	Cholecystitis	Jaundiced
35		43 6	Catarrhal jaundice	Recovered
00	3078	75	Gall stones	Considerable icterus Bile in urine Died after operation
155	4440	190	Obstruction of common duct	Intense jaundice with bile in urine Died
72	5853	200	Acute yellow atrophy follow ing salvarsan	Jaundiced Bile, leucin and tyrosin in urine Died
74	6409	56	Carcinoma of colon	Faint icteric hue Died.
75	6075	62	Catarrhal jaundice	Skin slightly colored
176	6090	30	Catarrhal jaundice	Patient jaundiced
177	D3 0	70	Hypertrophic cirrhosis	Skin slightly colored
178	6138	87	Acute yellow atrophy Toxæmia of pregnancy	Bile, leucin and tyrosin in urine Skin jaundiced Recovered
70	7968	21	Cholecystitis	Deeply jaundiced Bile in urine
180	677	92	Gall stones	Skin deeply jaundiced Died

Case No 3205 acute hepatitis in a male. The icterus index was 112 on admission the patient showed marked jaundice, and bile was present in the urine. The subsequent determinations of the icterus index one week apart were, 111, 108 103 and 105 During this time the variation of the icterus index was very slight indicating no change in the amount of jaundice The skin coloration remained the same

Case No 6409 male, carcinoma of colon, admitted October 25 1921 The scleræ and skin of this patient were normal in appearance and the icterus index was 12 No bile was demonstrable in the urine. At operation metastases to the liver were found, thus explaining the pathological index of 12 After operation, a jaundice developed and the icterus index rose to 56 bile being present in the

urine Death of the patient prevented further observation

Case No 5883 female, acute yellow atrophy of liver, following salvarsan injection One day before death the icterus index was 210, and bile was present in the urine

Case No 6771 female cholecystitis with common duct obstruction The patient was admitted to the hospital on November 9, 1921 with considerable jaundice On November 15 the icterus index was 92 and bile was present in the urine On November 17 the icterus index rose to 120 The patient was operated upon November 19 and died on the following day

CONCLUSIONS

The icterus index is of value in determining the presence of jaundice and offers a more delicate and accurate means of ascertaining the increase or decrease of jaundice than does any clinical or laboratory test now generally in use

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A PATHOGNOMONIC SIGN OF INTRA-UTERINE DEATH[1]

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DEATH of the fœtus *in utero* is a sufficiently common occurrence to justify the presentation of any additional diagnostic aids that may be discovered Heretofore the history together with the subjective symptoms and the physical signs, have been the factors utilized to arrive at a diagnosis of intra-uterine death Laboratory tests have been unsatisfactory

In regard to the past history syphilis either in the father or mother chronic nephritis in the mother or habitual death of the fœtus from unknown causes are the suggestive points The patient may or may not complain of malaise with bad taste in her mouth feeling of weight in the abdomen nausea and vomiting breast changes failure

slight rise in the body temperature or a subnormal cervical temperature, stationary weight and stationary or diminished height of the fundus of the uterus or possibly may elicit crepitation in the fœtal head bones by vaginal or abdominal palpation.

The last sign is practically the only positive diagnostic sign existing at present. In the Women s Clinic of Stanford University we have during the past few months made positive diagnoses of intra uterine death by the aid of X ray pictures of the fœtal skull and from a review of the literature this seems to be an original observation

It seems that very shortly after intra uterine death the brain tissue shrinks which produces a typical overlapping of the fœtal skull bones This overlapping of the fœtal skull bones seems to be pathognomonic of the condition of the intra-uterine death and gives a picture quite different from the overlapping produced by molding

With the X ray the decreased size of the fœtal head from post mortem shrinking can be determined because the cranial bones remain nearly the same size and shape As the head shrinks, the bones overlap at times to an astonishing distance The radius of curvature of the shrunken head becomes obviously smaller than that of the unchanged cranial bones. When both the above changes are noted in the X ray picture it seems justifiable to conclude that the child is dead and such has been our experience in the X ray study of 21 babies *in utero* In this series, 3 babies were dead and presented the typical findings 18 were alive of which 17 showed no changes in the X ray picture of the fœtal head and the suture lines One baby showed marked overlapping of the skull bones due to molding caused by a long first stage of labor but in spite of this overlapping the skull

[1] Read before Society of the Alumni of the Lucas Hospital for Women April 8, 19



Fig. 1 Shows fœtal skull of dead baby. There is extreme overlapping of the fœtal skull bones (see arrow) and the skull surface is seen to be much larger than the bulk of the skull contents.



Fig. 2 Shows overlapping of skull bones with marked shrinking of skull contents (see arrows). The skull bones show no evidence of pressure.

bones showed no disproportion in relation to the bulk of the contents of the skull

The following are the histories of the three patients with intra uterine death

CASE 1 Mrs. B., Clinic No 97829 age, 42 gravida 1 para-0 registered in the Women's Clinic Stanford University School of Medicine August 22 1921 She complained of amenorrhœa since May 13 1921 no nausea occasional headaches *pains in lower abdomen.*

September 16 the fundus measured 14 centimeters above symphysis. The pelvis was normal Labor was due, by Naegle's rule February 20 1922 Patient felt life on October 12 Blood pressure 130–80

December 13 she complained of pains low down in pelvis. She had not felt life since December 2 and thought her abdomen was getting smaller She had a constant salty taste in her mouth Blood pressure 138–94 Fundus 18 centimeters above symphysis.

December 19 fundus 21 centimeters. No fœtal life Head could be felt by bimanual examination and thought to feel soft Patient vomited every *morning She entered hospital. Hospital history* states that patient has had measles, scarlet fever and diphtheria. Appendectomy had been done three years ago Blood pressure 125–85 No fœtal heart heard. Braxton Hicks contractions were present, but no fœtal movements were noted Fœtal head could be felt above cervix but did not *give the characteristic hard feel.*

Fundus measurements were as follows

	Centimeters
September 16 1921	14
November 30 1921	18
December 13 1921	18
December 20 1921	18

December 20 1921 X ray picture of uterine contents showed overlapping of the fœtal skull bones with apparent shrinkage of the skull contents (Fig 1) A diagnosis of intra uterine death was made and labor was induced December 22 with Voorhees bags. She was delivered of a dead baby December 23 The liquor amnii was dark and dirty looking The head was soft showing beginning maceration. The legs and feet and parts of body were macerated The fœtus had apparently been white in was negative. Blood count 4,024,000 red cells hæmoglobin 85 per cent leucocytes, 7 000 polymorphonuclears 69 per cent lymphocytes, 25 per cent



3 Shows fœtal skull of dead baby There is marked ...pping of the fœtal skull bones (see arrow) with ...disproportion between surface of skull bones and ... contents



Fig 4. Shows the fœtal skull of normal pregnancy

The urine was normal except that specific gravity varied from 1026 to 1008

Autopsy on the baby showed definite widening and irregularity of the epiphyseal line of the rib and femur The lungs showed definite fibrous thickening of the septa of the alveoli, otherwise negative Diagnosis congenital syphilis

Case 2 Mrs T Clinic No 74294, age 29 gravida 2 para 1 registered in Clinic September 21 1921 December 30 her blood pressure was 144-90 She had been delivered by Cæsarean section on May 10 1918, of a live baby because of eclampsia with marked œdema, granular casts, and blood pressure of 210-140

January 13 1922 her blood pressure rose to 160-100 Headache and œdema of legs. She entered hospital Labor was due March 22 Fundus measured 32 centimeter above symphysis Fœtal heart was heard r right lower quadrant Patient left hospital February 3 with a blood pressure of 145-100 to be observed by the Social Service Department

February 23 re-entered hospital with blood pressure of 140-85 no toxic symptoms, fundus measuring 31 centimeters Fœtal heart could not be heard, and an X ray picture of the abdomen was taken This picture showed the typical findings of intra-uterine death (Fig 2)

Shortly after returning from the X ray Department, the membranes ruptured with a discharge of a quantity of dark coffee-colored amniotic fluid A dead baby was delivered with easy low forceps, and immediately after labor patient's blood pressure was 130-82

Examination of placenta showed white infarcts with signs of infection in the placenta, otherwise normal Wassermann was negative Blood examination showed 4,120,000 red cells, hæmoglobin 90 per cent, 10,400 white cells 76 per cent polymorphonuclears, 20 per cent lymphocytes Urine examination showed a low specific gravity with light cloud of albumin but no casts.

Autopsy on the baby showed definite widening and irregularity of the epiphyseal line of the rib and femur Diagnosis congenital syphilis

Case 3 Mrs A., Clinical No. 100933 age 38 gravida 2 para-0 registered in Clinic December 9 1921 Last menstruation was April 1 She gave no history of infections She has had some swelling of feet and hands during present pregnancy Married 20 years spontaneous abortion at 4 months 10 years ago Heart and lungs negative Breasts large Fœtal heart faintly heard in left upper quadrant. Child lying in occipitolævo-anterior position. No engagement of presenting part Fundus was 33 centimeters above symphysis. Pelvic measurements were normal Labor was due January 8 1922

December 20 fœtal movements were very active Blood pressure 174-88.

January 4 1922 because of hypertension patient was given castor oil and quinine but no labor pains resulted Blood pressure 146–82 Fundus was 33¼ centimeters above symphysis Fœtal heart sound in right lower quadrant strong regular rate 140

January 27 patient entered hospital with blood pressure of 150–90 Fundus 29½ centimeters above symphysis Fœtal heart could not be heard January 28 fœtal heart could not be heard no fœtal movements. Braxton Hicks contractions present Blood pressure 140–85 Bimanual examination of fœtal head gives an impression of crepitation in the skull bone, but this is not distinct

Fundus measurements have been as follows

December 9 1921	33
December 20 1921	33½
January 26 1922	29½
January 29 1922	29

X ray picture of contents of uterus shows a well grown *fœtus with head floating* There is a little shrinkage of the head as evidence of overlapping of the sagittal suture (Fig 3) Diagnosis intra uterine death of fœtus.

January 30 spontaneous labor began and patient was delivered of a dead baby

Examination of placenta was normal Wassermann negative for both husband and wife Examination of blood shows hæmoglobin 75 per cent, 9 250 white cells, polymorphonuclear 66 per cent lymphocytes 24 per cent Urine examination normal except for a slight trace of albumin

Autopsy on the baby showed very marked widening and degeneration of the epiphyseal line of the rib and femur Diagnosis congenital syphilis

CONTROLS

The fœtal skull *in utero* has been studied by means of X ray pictures in 27 patients with normal pregnancy In no instance can there be seen any overlapping of the fœtal skull bones or any diminution in the size of the skull contents (Fig 4)

One patient with normal pregnancy had rupture of the membranes with beginning labor She had a long first stage of labor lasting 43 hours due to rigidity of the cervix, but was eventually delivered of a live baby An X ray picture taken late in the first stage of labor shows marked overlapping of the fœtal bones but there is no sign of diminution of the skull contents This overlapping can be easily differentiated from that produced by intra uterine death (Fig 5)



Fig 5 Shows the fœtal skull of live baby with over

CONCLUSIONS

From a study of fœtal skulls with the X *ray in 31 cases of pregnancy it has been* found that with live babies the fœtal skulls appear normal except for the effect of labor which produces an overlapping of the skull bones In three cases of intra uterine death, the X ray picture showed the marked overlapping of the skull bones with distinct signs of shrinkage of the skull contents

From these facts we believe it is justifiable to state that shrinkage of the skull contents with overlapping of the skull bones can be demonstrated with the X ray, which gives a pathognomonic sign of intra uterine death

Thanks are due to Dr Hans von Geldern resident in obstetrics and gynecology for assisting in the study of these cases, and to *Dr R. R. Newell*, assistant roentgenologist in the Stanford School of Medicine who made the photographs and interpreted the X ray findings.

ELEPHANTIASIS TREATED BY THE KONDOLEON OPERATION

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A NUMBER of articles have appeared in medical literature discussing the Kondoleon operation for the relief of elephantiasis of the extremities As this condition is rare in the United States we have but a limited number of cases upon which to base statistics of end results Since the degree of value of the operation is still debatable, all cases of this kind should be duly reported Devised by Kondoleon, of Greece, it has been employed by Matas, Royster Hill Sistrunk and others in this country It cannot be considered a cure for elephantiasis but is assuredly the best step so far introduced tending to make lymphatic obstruction of limbs bearable and controllable

Elephantiasis, we will remember is pathologically due to an obstruction of the lymphatic vessels of the part resulting in hyperplasia of the skin and tissues which macroscopically are thickened waxy and indurated

In selecting a case for operation the following should be observed (a) Blood Wassermann must be negative, hæmoglobin at least 70 per cent (b) Patient s general health must be carefully considered Operation should not be undertaken in the presence of an active dyscrasia Existence of a curable chronic trouble need not stand in the way of hope for a future operation For example one of my cases suffered from an acute empyema and fibroid tuberculosis 2 years before one leg was surgically treated (c) Every means of reducing the size of the limb must be thoroughly tried previous to surgical interference, such as rest in bed and elevation of the member care of the skin particularly if ichthyosis and local patches of infection exist massage employment of elastic bandage or stockinet

My practice has been to prepare cases in this manner beginning 2 to 4 weeks prior to operation. These precautionary measures reduce the chance of infection and put the affected area into a more pliant state.

The principle of the operation is the establishment of a connection between the superficial and deep lymphatics — the latter generally being uninvolved This is done by permanently breaking the fascial wall lying between the muscles and subcutaneous tissues boldly removing wide wedges of tissue from the inner and outer aspect of the entire length of the affected limb each wedge comprising skin fat and deep fascia (9)

If the enlargement is not extreme at the joints it is an advantage to break the incision opposite them thus avoiding a skin scar at these points These cutaneous bridges are readily undermined allowing an easy removal of the required amount of fascia and infiltrated fat I do not stitch the fascia for this tissue is usually so thick and waxy that it seems unnecessary to tack it in place. The muscle substance is not to be broken into This point is important, for it eliminates the chance of painful adhesions An assistant inserts dry gauze packs as fast as the sluices are cut over which the flaps are firmly compressed following the operator as he proceeds. After the entire sulcus has been fashioned the larger bleeding points are caught but not ligated until all secondary trimming has been completed thus avoiding re-tying

I employ drainage because this is an aid to the general reduction of the limb allowing lymphatic material to escape besides it is the logical thing with so much raw surface

It is inadvisable to operate upon both sides of the limb at one time the better plan being to attend to corresponding sides of the extremities at the same sitting In the leg the outer surface should be attended to first because, when operating upon the inner aspect the long saphenous system is necessarily interfered with which tends to throw an added strain upon the drainage of the leg At the second sitting there is already established a communication between the deep and superficial lymphatics of one side of the leg and a general reduction of the limb having taken place, the saphenous vein and its tributaries can be better spared The one



a b c

Fig 1 Case 1 a, b 2 months after final operation calf 14⅝ inches, thigh 27 inches, c 3 months after final operation calf 14⅝ inches, thigh 13¾ inches, affected leg, calf 13 inches, thigh 15 inches. Tissues, however soft and pliant.

advantage of the asymmetric plan of attack is that it allows the patient the comfort of lying upon one side

The second operation should not be undertaken until at least 6 weeks after the primary and not then if there is a discharging sinus along the track of the former incision After operation the limb should be firmly bandaged and elevated and if drained dressed daily Patient should not be allowed to hang member down, or step upon it for at least a month after operation and then should not do so without the employment of a pressure bandage or elastic stocking

The patient must not be led to believe that a complete cure requiring no further attention can be attained It must be made clear that some sort of support, preferably in my opinion an elastic stockinet, must be worn for the balance of life Also, light massage must be employed from time to time.

In summarizing my experience with the operation I glean the following facts

1 The Kondoleon operation is a commendable surgical procedure and the only one that gives any real relief

2 It is not a curative operation for there is a tendency toward return of the enlargement of the involved extremity, especially if unsupported

3 Its recurrence in most cases can be held in check much more readily than the original enlargement could be controlled

4 Patient is rendered decidedly more comfortable and does not suffer from pain or ill effects following the operation.

I submit three case reports as follows

CASE 1 H W female, white age 23 Twelve years ago patient noticed slight swelling in left ankle every evening It was painless at first but after 4 months was painful Swelling gradually spread over entire leg and became permanent Eight years ago leg attained its maximum size and the tissues became more brawny Two years ago patient's general health declined and a diagnosis of fibroid phthisis was made shortly after patient underwent empyema operation Following this she came under my care suffering with marked secondary anæmia and fibroid pleurisy One and one-half years ago she had sufficiently improved to warrant Kondoleon operation The outer surface of leg was attended to and in 6 weeks the inner side Though there has been some recur- [illegible] lt and is ready [illegible]

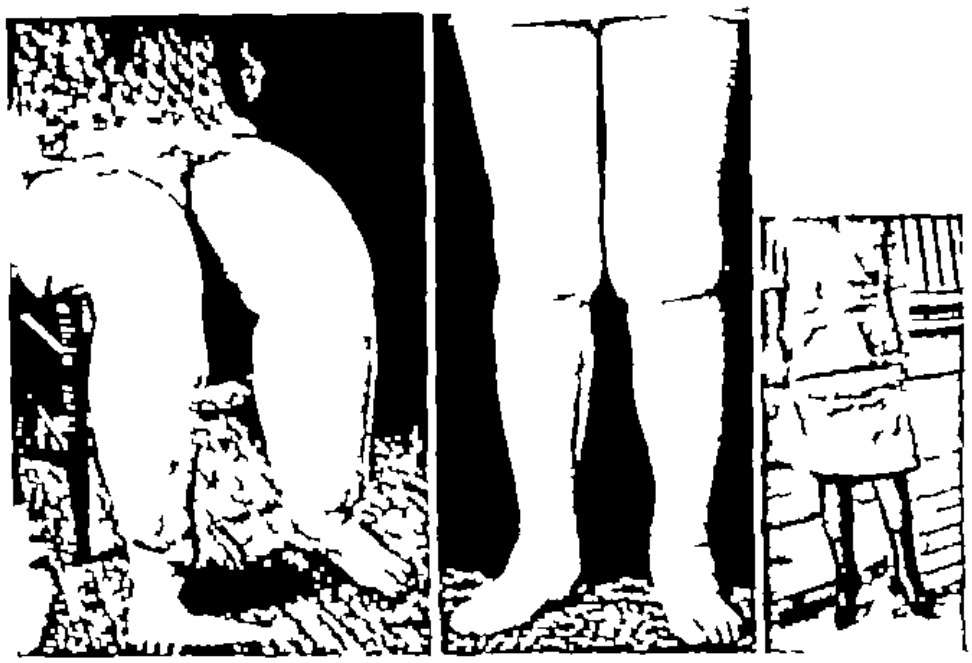


Fig. Case 2. a, 2 years before operation. b, 4½ months after final operation. c, 4½ months after final operation. (Notice how comfortably she wears shoes and stockings.)

size and induration until 8 years ago when maximum size was attained. This maximum size continued until the operation, except in the right thigh which, a few months before the Kondoleon, diminished slightly in circumference, and was painful

attended by slight soreness. For 3 years this swelling gradually increased and the leg became brawny and indurated and unwieldy to move. There was no swelling above the knee. Circumference was 7.5 inches larger than the normal leg. Re-examination 18 months after operation discloses slight tendency to enlargement. Possibility of recurrence had not been explained to patient and she is not well satisfied with result.



Fig. 3. Case 3. ½ years after operation,—slight tendency to return though tissues are soft. There is still a reduction of 6 inches from the original enlargement.

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TRAUMATIC ORBITOFACIAL EMPHYSEMA

By GEORGE G DAVIS, M.D., F.A.C.S Chicago

TRAUMATIC facial emphysema is not a common complication of face injuries, but when it occurs it is usually secondary to fractures of the nasal bones More rarely it occurs from fracture of the lacrimal, ethmoidal or frontal bones Brav (1) reported a case of orbitopalpebral emphysema caused by perforation of a dental canal

In Brav's case a dentist while drilling on the mesial root of the right upper first bicuspid accidentally perforated, by way of the dental canals, into the antrum of Highmore and farther through the bony roof of the antrum, making an opening through which air escaped into the subcutaneous tissue Immediately following the accident, the lids of the right eye began to swell until the eye was entirely closed and this emphysematous condition quickly involved the right side of the face as far down as the neck giving an asymmetry of the face as the result of the unilateral swelling which was rather hideous in appearance The patient suffered no pain from the condition A pressure bandage was applied for 2 days and the emphysema disappeared at the end of 5 days

Potter (2) reported a case of hydropneumo-cranium, with air in the ventricles, which was the result of a fracture of the frontal bone The patient, a male, aged 40 years, fell from a height of 15 feet striking mainly on his hands and face. Skull plates disclosed a frontal skull fracture, comminuted, somewhat stellate, centering about the right supra-orbital arch and involving both the internal and external walls of the frontal sinus and the orbital plate Inside the cranium, at the site of fracture there was evidence of gaseous accumulation in volume and shape comparable to a small hen's egg This was noted 3 weeks after the injury Two weeks later there was considerable increase in the volume of the subdural gas chamber, and the lateral ventricle was also appreciably gas-filled The air in the cavity was displaced by fluid and gradually disappeared

In 1905, McArthur (3) reviewed 33 cases of external pneumatoceles of which 23 were



Fig 1 Roentgen-ray anteroposterior view taken December 4, 1921 one day after injury showing semilunar shaped air spaces in the superior portion of either orbit



Fig 2 Roentgen-ray lateral view taken December 4 1921 one day after injury showing air spaces in the superior portion of the orbits and also the rather spacious pneumatic areas of the frontal sinus and thin walls of same



Fig 3 Photograph, taken December 7 1921 4 days after the injury showing discoloration about the bridge of the nose and in the infra-orbital regions

in relation to the mastoid and 10 to the frontal sinus Ten developed after trauma and in 10 cases also there was evidence of pre-existing bone disease which was considered a predisposing factor to the development of pneumatocele after slight trauma Also some history of increased air pressure in the buccal and oral cavities was frequently given

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diately to the hospital where it was noticed that he had a hemorrhage from the nose blood escaping from both nares There was a contusion of the frontal region with marked swelling and discoloration at the bridge of the nose

Shortly after the injury he blew his nose, following which there was considerable swelling which came on rather suddenly This extended upward

driven from one place to another by the fingers, and pitting on pressure was apparent

Skull plates taken the day following the injury



Fig 4 Roentgen-ray anteroposterior [illegible] 8 days after injury showing that the semilunar shaped air spaces in the frontal regions ha[illegible] disappeared

of the nose that crackled on pressure Discoloration (Fig 3) of the tissues about the bridge of the nose

[illegible]

no further signs of air being present in the tissues. At no time was there air within the cranial cavity as seen in Potter's case nor air between the cranium and periosteum as noted in cases of pneumatocele of frontal region reviewed by McArthur

The manner in which the air entered the orbits and soft tissues about the upper half of the face in this case is not definite either from physical examination of the patient or roentgenographic examination of the skull However the skull plates disclose very large pneumatic spaces in the frontal sinuses and the walls are very thin and irregular It seems probable that a fracture of the frontal sinus entering into the orbits was present The blowing of the nose, causing an increased air pressure in the buccal and oral cavities was the immediate cause of the sudden emphysematous condition.

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A STUDY OF EXPERIMENTAL PYLOROPLASTY[1]

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ONE hears from various sources expressions of dissatisfaction with present methods of dealing with pyloric obstruction. On the one hand, the operation of gastro-enterostomy while technically a highly perfected operation and one which has done great service to mankind in the relief of suffering and the saving of life, is yet an operation which does such violence to the physiological relationships in the upper digestive tract that it must always fall far short of being an ideal surgical procedure The complications and unfortunate sequelæ which are sometimes met with are well known and need no discussion These and also those more vague after-effects, which sometimes follow this operation while not of sufficient frequency to discountenance the operation are yet a constant stimulus in the attempt to find a more physiological method of treatment. With regard to the various pyloroplasties, on the other hand, of all which have been devised, the relative infrequency with which any is used (with the exception of the Rammstedt operation in congenital stenosis) is eloquent testimony that they are surrounded by greater doubt and difficulty than is gastro-enterostomy

It is not the purpose to discuss here the various pathological conditions of the pylorus which result in obstruction, nor the different operative difficulties to be overcome in dealing with the different lesions Dogs, unfortunately, do not furnish obstructions at the will of the investigator so we were compelled to work with normal tissues and have directed our attention to the general operative possibilities of this region rather than to the treatment of any particular lesion

Our first problem was the adaptation to the pyloric region of the principles of pedicled flap operations which have gained such wide application in plastic surgery Some difficulty was encountered in obtaining a flap to which a free blood supply could be preserved. This was finally done in the following manner The proximal end of the duodenum and the adjacent end of the stomach were opened up by an incision starting on the ventral aspect of the duodenum about 3 centimeters beyond the pyloric sphincter and extending back through the pyloric sphincter and the ventral wall of the stomach to a point in the stomach about 4 centimeters proximal to the pyloric ring From this point two curved incisions were made almost to the greater curvature of the stomach and including between them a flap of the stomach wall in the shape of a half crescent. This flap could always be so chosen that it had a good blood supply at its base from one or two large branches of the right gastro-epiploic artery This crescentic flap was then drawn into the first incision, the tip of the flap fastened at the duodenal extremity of the incision and after trimming away any redundant mucosa, the flap was firmly fixed in its new location by a line of continuous suture carefully placed so as to secure complete hæmostasis and edge-to-edge approximation but no inversion of the edges The incisions made in outlining the flap were closed by lines of suture extending to either side from the base of the flap The plan of this operation is shown in Figures 1a and 1b

The operation described was performed on a series of eight dogs. On four of these dogs, the incisions were made through all the coats of the stomach and duodenal walls. On the other four dogs of the series, an exactly similar operation was done except that all incisions were made only to the

[1] The work upon which this paper is based was done in 1916 and 1917 In the Department of Surgical Research of the University of Pennsylvania, and the results were presented at the tenth annual meeting of The Undergraduate Medical Association of the University April 20, 1917 Publication at that time was prevented by the military service of the authors.



Fig a (at left) Incisions for the plastic flap operation b Lines of suture used in transplanting the flap into the pylorus and in closing the stomach incisions.

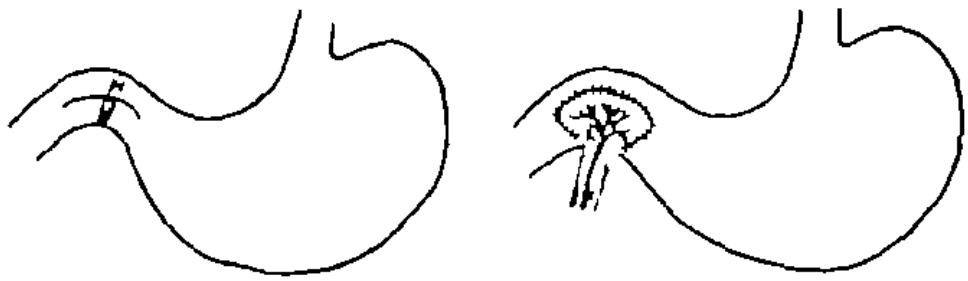


Fig (at left) Incision of stomach and duodenum to receive jejunal transplant. b Jejunal transplant sutured in place

submucosa Thus, without having entered the lumen of the stomach or gut, a seromuscular flap was taken from the wall of the stomach and sutured into the incision which had been made through only the outer coats of the pylorus In these operations if a double row of sutures is used inverting the edges as is customary in gastro-intestinal work the inverted edges encroach to such an extent on the lumen of the canal at the pyloric ring that the net result of the operation is to decrease the lumen and not to enlarge it To avoid this and secure a true enlargement we made a single continuous suture to secure edge-to-edge approximation but never any inverting suture to get contact of serous surfaces Instead the pylorus was covered with a free edge of omentum which was held in place with two or three interrupted sutures

The recovery of all eight dogs was uncomplicated The dogs were autopsied at dates varying from 2 weeks to 6 months after operation None showed any extensive peritoneal adhesions or other evidence of peritonitis In all the pylorus appeared to be functioning normally The omentum somewhat thickened was still closely adherent where it had been attached at the time of operation No marked enlargement had been secured in any case The seromuscular flaps showed a marked tendency to retract to the original site, leaving little evidence of ever having been in the pylorus. The flaps which included all coats retained better their new position and could be easily recognized on the mucosal surface where the strip of gastric mucosa contrasted sharply with that of the duodenum into which the flap extended The tissues were healthy but the flap dimensions were decreased and the pylorus had returned to almost its normal size In two or three cases where the retraction of the flap was quite marked there was evidence that the flap had exerted a definite pull for the duodenal mucosa had been thrown into folds which converged to the point where the tip of the flap was attached It furthermore appeared that this pull, acting on the muscular coats, was helping to restore the pyloric ring for the cut fibers which the flap had separated were being brought close together as they were pulled after the retracting flap

To test the action of the pylorus in the presence of a really marked enlargement, we next implanted into a large incision through

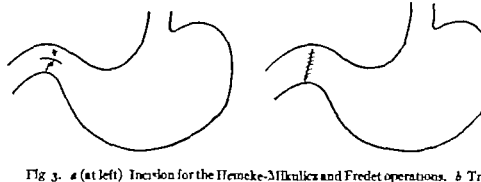


Fig 3. *a* (at left) Incision for the Heineke-Mikulicz and Fredet operations. *b* Transverse closure of pyloric incision in the Heineke-Mikulicz and Fredet operations

the pylorus a piece of jejunum which was obtained and inserted as indicated in Figures 2a and 2b The segment of gut resected was opened along its antemesenteric line The retangular piece of intestine, thus obtained was trimmed to a suitable shape and sewed into the opening which had been made in the pylorus A good blood supply was preserved for this flap by a mesenteric pedicle containing one of the larger mesenteric branches

The two dogs of this series made a good recovery One, at autopsy 5 weeks after operation, showed the pylorus greatly increased in size by the large bulging flap The flap tissue was healthy and was still getting some of its blood supply from the pedicle in which a pulsating vessel was easily seen The other dog of this series when killed 7 months after operation showed a markedly enlarged pylorus with the flap tissue healthy, but there had been a slight decrease in the size of the transplanted flap and the mesenteric pedicle, with its blood vessels was reduced to a thin fibrous band

Next on a series of four dogs, we performed an operation as illustrated in Figures 3a and 3b This is the Heineke-Mikulicz operation slightly modified in that the sutured edges were not inverted and in two of the dogs, the incisions were made only down to the submucosa, as done by Fredet (1) These operations gave at the time of operation, a moderate enlargement of the pylorus, but when autopsied at periods varying from weeks to months after operation none of these animals showed any permanent enlargement of the pylorus

On another series of eight dogs, we performed the Rammstedt operation (2) with the exception that whereas the Rammstedt operation is merely an incision through the muscular coats of the pylorus allowing the mucosa to bulge, we, in some of the dogs to exaggerate this and test the safety of the procedure, resected a strip of the serous and muscular coats to allow still greater prolapse of mucosa (Fig 4) In a few cases while resecting the seromuscular strip the mucosa was accidentally punctured and had to be closed with a fine purse string suture. In all cases the pylorus was finally covered with an edge of the omentum

All these dogs made good recoveries A few were reopened under ether anæsthesia, after varying periods of time, that we might observe during active peristalsis the action of the pylorus after operation We were able to observe that when a peristaltic wave reached the region where the muscle wall had been cut the contraction of these fibers, instead of causing a constriction in this region caused an even wider gaping and an increased bulging of the mucosa. This intermittent pulling apart of the edges of the muscular wound by peristaltic contractions would seem to be the explanation of the fact, already clinically recognized that after the Rammstedt operation recurrence of stenosis is exceedingly rare (3) On autopsying these dogs, we found the cut edges of the muscular coats to be still gaping widely In some cases the bulging mucosa was partially restrained by the overlying omental transplant, but there was no tendency toward stricture

The objection is sometimes raised that the Rammstedt operation creates a dangerous weak spot in the gastro-intestinal wall. With this in view we tested five of the dogs of this



Fig 4 Showing area of serous and muscular coats removed

series as follows At autopsy the stomach and duodenum were removed in one piece We then attached one end of the specimen to a gas tank, the other to a pressure gauge and slowly inflated the specimen until rupture occurred Rupture took place in every case not at the site of operation but in the cardiac end of the stomach The average pressure at rupture was 4¼ pounds per square inch In two cases, further test was made by inflating only the pyloric end of the stomach and of the duodenum In these cases rupture did not occur until an average pressure of 11 pounds was reached and still rupture did not take place at the site of operation but toward the stomach end of the specimen Different investigators have reported intragastric pressures for the pyloric end of the stomach, varying from 25 to 162 centimeters of water (4 5) In our tests there was required to rupture this region of a stomach a pressure equivalent to 748 centimeters of water Thus it is seen that the areas subjected to the Rammstedt operation resisted successfully a pressure four and one half times the maximum intragastric pressure reported

To test further what factor the muscular coats constitute in the mechanical strength of the gastro-intestinal wall we took segments of jejunum from a dog just killed and tested the degree of pressure required to rupture the segments under the following conditions (1) with all coats intact (2) with an incision made through the serous and muscular coats down to the submucosa (3) with an incision made from inside the lumen through the mucosa and submucosa leaving the muscle intact.

Each of these tests was repeated three times. We found that to rupture the intact wall of this region required an average pressure of 17 pounds With an incision through the serous and muscular coats, it still required an average pressure of 17 pounds to cause rupture and rupture did not always occur at the site of the incision With the mucosa and submucosa cut on the other hand the average pressure at rupture was 10 pounds and rupture took place in each case at the site of incision

It would thus seem that the resistance of the gastro-intestinal tract to a distending force is not appreciably decreased by cutting the muscular coats Further it is evident that there is a large factor of safety in the mucosa and submucosa alone for they were able to resist a pressure many times greater than the highest recorded by Cannon in his review of the literature on intragastric pressure (6)

CONCLUSIONS

1 A plastic flap operation or the Heineke-Mikulicz operation can secure temporarily a true enlargement of the pylorus if the edges sutured are not turned in

2 A normal pylorus enlarged by any of the foregoing procedures except the Rammstedt tends to return toward its normal size. Whether a stenosed pylorus thus operated upon would return to its former stenosed condition or would retain a lumen of normal size is still uncertain

3 A plastic flap operation is unsatisfactory on account of requiring such extensive incisions into the lumen of the canal. It is also unsatisfactory on account of its tendency to retract and restore the divided pyloric sphincter

4 The Rammstedt operation or so-called partial pyloroplasty is when conditions will permit, the most effective way of enlarging the pylorus It has the advantage of being the simplest operation yet devised for this purpose and requires very little time under anesthesia The objections sometimes raised are

1 Danger of hemorrhage from the exposed submucosa

2 Danger of peritonitis from puncture of the mucosa

3 Recurrence of stenosis,

4. Danger of rupture at the "weak spot' created

The first two of these dangers can be avoided if extreme care is used in performing the operation The third has already been answered clinically (3) The fourth is shown to be unfounded on account of the large factor of strength residing in the submucosa.

We feel that the principle of the Rammstedt operation should not be confined entirely to cases of congenital stenosis but should be given more general application in the surgery of the pylorus

NOTE —Since the presentation of this paper there have been a number of additions to the literature on this subject We would call attention especially to the following

1 The report by Downes of a new and larger series of cases of use of the Rammstedt operation in congenital stenosis (7)

2 The report by Graham on the use of the Rammstedt operation in a case of pyloric stenosis in an adult (8)

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EXPERIMENTAL RECONSTRUCTION OF THE ŒSOPHAGUS BY GRANULATION TUBES

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VARIED attempts by widely different operative procedures have been made to solve the problem of reconstruction of the œsophagus after removal of segments of the organ. It has been realized for a long time that this is a basic problem in the surgery of œsophageal stenosis, for, whether the lesion is a benign or a carcinomatous stricture of the organ the ideal would evidently be a restitution of the passage for food after operative removal or side-tracking of parts of the organ The many experimental and occasional clinical efforts that have been made with this purpose in view have consisted either in partial or in total œsophagoplasty It would lead too far afield to enter into the details of these methods In brief, it may be said that the earliest plan was the formation of a skin tube fashioned from the skin of the anterior chest wall, to which the œsophagus above the stricture was attached superiorly and the stomach below Later developments consisted in the use of implants of loops of small or large intestine isolated in various ways, and, finally, tubes or flaps from the gastric wall were employed for this purpose

Experimentally these methods have been followed by occasional successes, and there are a few instances in which clinically, too they have proved satisfactory In the human being such procedures involve multiple operations over a period of many weeks or months with the ever present likelihood of failure from complications Infection or gangrene of the isolated portion of the hollow viscus, etc. The technique of these œsophagoplasties is complicated, and the patient must necessarily be in good physical condition to withstand the several major operations. In fact, against the few successes that have been reported there is the probability of a much larger proportion of unreported failures and an operative mortality that is not negligible

If progress is to be made in this field it is essential, we believe to separate the problem of œsophagoplasty into two distinct parts—a plan of operation adaptable for benign stenosis and one for cancer of the œsophagus In the former, a considerable length of the

organ may be involved or the strictures may be multiple the patient is usually young and in good physical condition and the problem is one of sidetracking and not of removing the disease. In cancer of the œsophagus the patient is ordinarily old and debilitated by the disease and the problem is one of replacement of relatively short segments of the organ. It is the latter problem that has engaged our attention in the experimental studies.

Before describing the experiments brief reference should be made to the methods employed for re-establishment of the food channel in the two successful cases of its resection for cancer In Torek's case no attempt at reconstruction was made A rubber tube connected the stump of the œsophagus in the neck with a gastrostomy opening Lilienthal employed a pedicled skin flap laid in place at the first operation which consisted in the isolation of the neoplasm After the removal of the growth, the skin flap was detached and the final result was a dermal channel to which the œsophageal ends became attached. The patient was a young individual in good physical condition it is questionable if the procedure employed by Lilienthal will prove applicable to the cases of œsophageal cancer that are usually encountered Indeed it was from observations made during the time the brilliant series of operations were carried out in his case that we were led to perform our experimental work

Repair of a wound of the œsophagus takes place by granulation tissue. Even a simple œsophagotomy with immediate suture will be followed by leakage until the incision in the organ is healed by granulation An erroneous impression exists that anastomosis between the œsophagus and some other hollow viscus will be followed by repair as seen in the peritoneal cavity The œsophagus has no serosal covering and the repair after operations upon the abdominal hollow organs depends primarily upon the existence of the serosal layer Since repair of the œsophagus takes place by granulation we determined to make use of this fact by establishing granulation tubes between the œsophagus stumps after resection of the organ Our plan was to isolate a given section of the œsophagus and surround it by packings. At the next stage the isolated portion was to be resected and a rubber tube sutured in place It was our impression that granulations would form about the tube and that the œsophageal epithelium would ultimately line the granulation tube

The experiments comprise a series of operations performed on thirteen dogs all under ether anæsthesia. The first operations were on the thoracic œsophagus Attempts were made to approach the organ through the posterior mediastinum but the pleura was invariably entered and death ensued from infection. The principles involved being the same and the technical difficulties fewer operations on the cervical œsophagus were practiced in all the subsequent experiments. A striking fact was soon noted in these experiments on the cervical œsophagus resection and rubber tube implantation in one stage was followed by death from infection A suppurative process extended from the wound down the cellular planes of the neck into the mediastinum to involve both pleural cavities. The following experiment will illustrate this

Experiment 1 Dog 1778 Weight 25 pounds *Operation February 4 1921* Incision 4 inches along anterior border of left sternomastoid muscle Three inches of œsophagus were isolated from trachea and surrounding muscles after retraction medially of the great vessels and vagus nerve One inch of œsophagus was resected and a T tube inserted and sutured into cut ends. The sternomastoid muscle with a small arm of T-tube coming through it was sutured thus completing a muscular tunnel around the tube The skin and fascia were closed A typical Witzel gastrostomy was done

February 5 1921 Dog died At autopsy the wound in the neck was found extensively infected with pus bathing the muscles, trachea, and cut ends of the œsophagus these ends however were held by the sutures to the tube The infection extended down the cellular spaces of the neck into the [illegible] extension from the posterior mediastinum Death was due to an overwhelming infection and sepsis.

On the other hand there have been no deaths from infection in the operation carried out in two stages, and we therefore regard this as the correct procedure. The technique

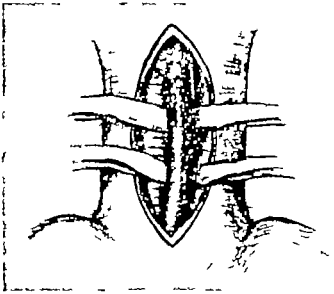


Fig 1 End of first stage of operation. Œsophagus isolated from surrounding structures and packed off In the actual operation, packings completely separate the organ from the trachea, great vessels, and muscles.

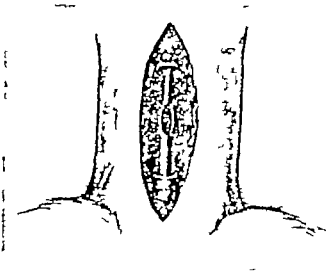


Fig 2 End of second stage of operation. A portion of the œsophagus has been resected and replaced by a rubber tube sewed into place above and below The tube bridging the gap lies on a bed of granulation tissue.

is in brief as follows A vertical incision is made to the left of the trachea and the œsophagus is exposed by retraction of the musculature and great vessels The vagi are stripped free, the branches going into the segment to be resected being sacrificed. The desired portion of the œsophagus being thoroughly isolated, gauze packings are placed beneath it the ends coming out of the wound The latter is left wide open At the second stage, one week later, the isolated portion of the œsophagus is elevated by traction on the packings and is divided obliquely above and below The packings and the segment of œsophagus are then removed A bed of granulation tissue is found to have formed beneath the packings. A soft rubber tube of the diameter of the œsophagus is securely sutured to the upper and lower ends of the organ by stitches passed transversely The rubber tube has a lateral opening in order to feed the animal by a catheter passed through it into the stomach When the tube becomes loose it is removed if it has not already been discharged from the wound

By this time the external wound is largely closed by granulation tissue. An œsophageal fistula, or rather a fistula through the new formed granulation tube, persists but finally closes completely

Three experiments illustrate the process of gradual reconstruction of the œsophagus by the granulation tube operation and their description indicates the results that have been obtained

At the end of one week the ends of the resected œsophagus are partly attached to a gutter of granulation tissue. Upon microscopic examination there is beginning union between the cut ends of the œsophagus and the adjacent partly formed granulation tube, the first stage of epithelial overgrowth extending from the œsophageal epithelium

Experiment 2 Dog 1965 Weight 11 kilograms *Operation, first stage April 1 1921* An incision was made to the left of the trachea, from the lower margin of the sternomastoid muscle upward along its anterior border to the lower pole of the thyroid gland The sternomastoid was retracted laterally vessels identified isolated and retracted The œsophagus was found behind and a little to the left of the trachea The left vagus nerve was carefully freed and retracted with the vessels, those branches to the œsophagus being sacrificed over the portion to be isolated. Two and one half inches of œsophagus were isolated surrounded by wet packings and the wound left wide open April 1 to April 8 dog was given normal diet by mouth

Second stage April 8 Weight 10 5 kilograms

of the isolated area was cut across obliquely with the dorsal wall of the organ longer than the ventral A soft rubber tube was inserted into the upper cut

end, and the edges of the œsophagus sutured to it, taking four sutures, one behind, one in front and two laterally These sutures were passed transversely and the knots were tied on the outside With the upper junction of tube and cut œsophagus now secure the œsophagus was cut across below and the lower end of the tube sutured here in a similar manner About 2 inches of the œsophagus were removed A window was cut into the tube for feeding purposes. The wound was left wide open

April 11 Dog has pulled tube out Œsophageal ends found and another tube inserted and sutured in place Feedings through an opening in it are to be continued

April 13 Tube has become loose again left out

passed into œsophagus, thence into the stomach

April 15 Since yesterday the animal has been vomiting and breathing with difficulty Death

Autopsy Infection of wound is limited to site of operation The lower cut end is firmly glued down to the granulation tissue, and it appears that the posterior wall of the granulation tube which has replaced the œsophageal defect is lined with epithelium its color is light pink and has a glistening appearance resembling the normal œsophageal mucosa The upper cut end is not yet glued down to the granulation tissue around it

Death was due to operation which was performed during pregnancy

Microscopic sections Sections taken through the

and a heaping up of the epithelium At this site there is a termination of the mucous glands and the muscularis ends by intertwining with the adjacent tissue This latter is granulation tissue presenting the earlier stages of organization with here and there islands and groups of polynuclear cells Toward the free surface vascularization is more marked there are many new formed blood

geal mucous membrane are not present (5) nuclei of cells are round throughout (6) very active mitoses are present (7) there is some polynuclear infiltration

Three weeks after operation the granulation tube is solidly formed with some distortion because the external fistula through the same still persists. The union between the divided ends of the œsophagus and the granulation tube is firm and there is a more extensive epithelial overgrowth arising from the œsophageal epithelium

Experiment 3 Dog 1809 *Operation first stage February 11, 1921* Typical Witzel gastrostomy done through a left upper rectus incision Five centimeters of cervical œsophagus were isolated by the usual technique, as already described Packings were placed around the œsophagus and wound left wide open

February 11–18 A tube has been inserted into the gastrostomy opening for feedings only Six ounces of milk were given twice a day and 7 ounces of water four times a day moderate emaciation animal in satisfactory condition except for diarrhœal stools

Second stage February 18 Resection of 3 centimeters of cervical œsophagus with insertion of tube, in usual manner

February 23 Tube has disappeared from wound apparently in the stomach

February 25 Condition of dog is satisfactory Œsophageal fistula, about 2 centimeters long, is present It seems that the defect has been bridged by granulation tissue Dog to be given water by mouth

March 1 Gastrostomy permitted to close Rubber tube is in stomach as shown by X ray picture

March 10 For the past 2 weeks the dog has been taking fluids by mouth Most of it passes into the stomach about 5 per cent escaping through the fistula in the neck However in a few minutes after swallowing food, it is regurgitated and escapes either through the fistula or is vomited.

Autopsy March 11 There is no infection of the

the termination of the œsophagus is indicated on the surface by a slight dipping in of the epithelium It is only marked definitely by the ending of the mucous glands in the depths The musculature grades into the tissue that occupies the defect well beyond the termination of the mucous glands, thinning out gradually and becoming ultimately intertwined with the young fibrous tissue The new-formed

mucosa of the œsophagus, with very little leucocytic infiltration

For the rest the tissue occupying the defect is of about the same thickness as the œsophageal wall and presents granulation tissue with considerable organization and many new formed blood vessels Sections from the upper and lower junction of the œsophagus with the new formed tube when taken together present the evidence that there has been considerable growth of epithelium over the granulation tube The middle portion however remains uncovered by epithelium and presents heaped up masses of polynuclear cells on the free surface of the granulation tissue

A dog kept for 7 months after œsophageal reconstruction by a granulation tube was in satisfactory physical condition during that period After an early stage of disturbed deglutition accompanied by repeated regurgitation of food this animal was able to swallow *fluids and mush but no large fragments of* food A stenosis of the œsophagus at the site of the granulation tube was noted, and it was apparent that this could have been dilated by bougies However, dilatation was not practiced because we wished to learn if the stenosis would be progressive, and thus vitiate the operative procedure. The stenosis remained stationary and was found at autopsy to have resulted in the reduction of the normal circumference by about one fourth. Furthermore, the autopsy showed that the œsophageal ends had been drawn toward each other, reducing the original defect of 5 centimeters by about one-half The lining by overgrowing epithelium was complete and the new formed œsophageal tube was of the same thickness and of greater resistance to hydrostatic pressure than the adjacent œsophageal wall



Fig 3 Junction of normal œsophagus and replace

this point.

Experiment 4 Dog 1929 Weight 15 kilograms *Operation first stage March 18 1921* Isolation of 7 centimeters of cervical œsophagus by usual technique

Second stage March 25 Resection of 5 centimeters of œsophagus The tube was sutured in place in usual manner

April 1 Weight 14 kilograms Animal in good condition has been taking feedings of milk and egurgitate. ie tube became loose The œsophagus was be felt An explora tory laparotomy did not reveal the tube in the stomach or intestines evidently it has been passed per rectum.

April 15 Weight, 12 kilograms. For the past few days the dog has been vomiting his milk. The milk is kept down for a short time and is then regurgitated. Soup and finely divided pieces of meat were tried with no better result The dog swallows the meat but it is caught in an œsophageal dilatation, due probably to a lack of nervous innervation. In a few minutes the meat and soup are vomited, some coming through the fistula but most of the mixture coming out of the mouth After repeated swallowings and acts of vomiting the food remains in the stomach Holding the animal up on his hind legs does not seem to aid in keeping the food down Feedings through the fistula are to be discontinued dog is to get meat soup milk and glucose water by mouth only

April 22 Weight 10 75 kilograms Dog is in fair condition although he still regurgitates food

good He is very active and runs around normally Fluids are kept down better *Œsophagoscopy* by Doctor Yankauer shows a stenosis at the site of the new formed tube

May 27 Weight 10 75 kilograms. The fistula is closed A No 20 bougie meets an obstruction at this region but passes it easily The stricture is apparently being gradually dilated by the passage of food

October 17 Weight 9 5 kilograms. During the summer the condition of the dog has been good Regurgitation of food has gradually become less although it still occurs.

Chloroformed

end and the edges of the œsophagus sutured to it, taking four sutures, one behind one in front and two laterally These sutures were passed transversely and the knots were tied on the outside With the upper junction of tube and cut œsophagus now secure, the œsophagus was cut across below and the lower end of the tube sutured here in a similar manner About 2 inches of the œsophagus were removed A window was cut into the tube for feeding purposes The wound was left wide open

April 11 Dog has pulled tube out Œsophageal ends found and another tube inserted and sutured in place Feedings through an opening in it are to be continued

April 13 Tube has become loose again left out The lower end of the resected œsophagus can be seen glued down firmly to the surrounding granulation tissue The upper end is not yet attached Feedings to take place through the œsophageal fistula, through which a catheter can easily be passed into œsophagus, thence into the stomach

April 15 Since yesterday the animal has been vomiting and breathing with difficulty Death

Autopsy Infection of wound is limited to site of operation The lower cut end is firmly glued down to the granulation tissue, and it appears that the posterior wall of the granulation tube which has replaced the œsophageal defect is lined with epithelium its color is light pink and has a glistening appearance resembling the normal œsophageal mucosa The upper cut end is not yet glued down to the granulation tissue around it

Death was due to operation which was performed during pregnancy

[illegible]

there is a termination of the mucous glands and the muscularis ends by intertwining with the adjacent tissue This latter is granulation tissue presenting the earlier stages of organisation, with here and there islands and groups of polynuclear cells Toward the free surface vascularization is more marked there are many new-formed blood

geal mucous membrane are not present (5) nuclei of cells are round throughout (6) very active mitoses are present (7) there is some polynuclear infiltration

Three weeks after operation the granulation tube is solidly formed with some distortion because the external fistula through the same still persists The union between the divided ends of the œsophagus and the granulation tube is firm and there is a more extensive epithelial overgrowth arising from the œsophageal epithelium

Experiment 3 Dog 1800 *Operation first stage February 11, 1931* Typical Witzel gastrostomy done through a left upper rectus incision Five centimeters of cervical œsophagus were isolated by the usual technique as already described Packings were placed around the œsophagus and wound left wide open

February 11–18 A tube has been inserted into the gastrostomy opening for feedings only Six ounces of milk were given twice a day and 7 ounces of water four times a day moderate emaciation animal in satisfactory condition except for diarrhœal stools

Second stage February 18 Resection of 3 centimeters of cervical œsophagus, with insertion of tube in usual manner

February 23 Tube has disappeared from wound apparently in the stomach

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March 10 For the past 3 weeks the dog has been taking fluids by mouth Most of it passes into the stomach about 5 per cent escaping through the

pinkish white tube of tissue, loosely attached to the

œsophageal lining The new formed tube showing

in the depths The musculature grades into the tissue that occupies the defect well beyond the termination of the mucous glands, thinning out gradually and becoming ultimately intertwined with the young fibrous tissue The new formed epithelium is similar in appearance to the old, being of about the same thickness. Papillæ are now well developed, the staining appearance is almost identical with that of the normal, and there is developed a subepithelial layer of tissue similar to the submucosa of the œsophagus, with very little leucocytic infiltration



Fig. 7



Fig. 8.



Fig. 9

Fig. 7 Granulation tube occupying defect. Three weeks after operation. Newly formed tube is of a lighter color than normal œsophagus. Stylet indicates fistula leading into neck.

Fig. 8. Same as Figure 7 opened up, showing granulation tissue bridging gap between normal œsophagus above and below

Fig. 9 Photomicrograph of junction of normal œsophagus and newly formed tissue, three weeks after operation Section indicates ending of mucous glands. Musculature intertwines with the newly formed fibrous tissue Regenerated epithelium very similar to the normal with well developed papillæ.

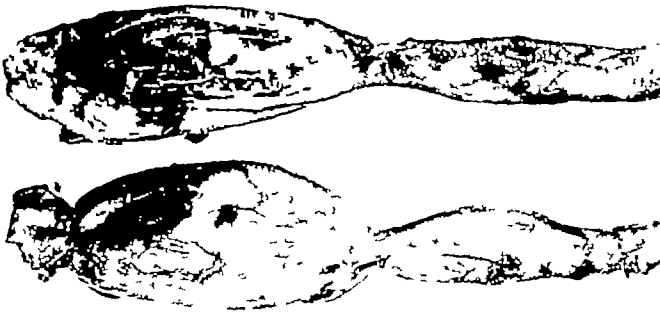
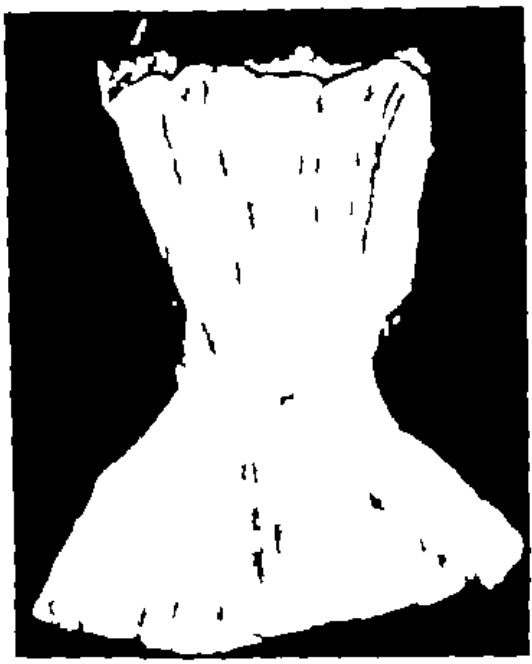
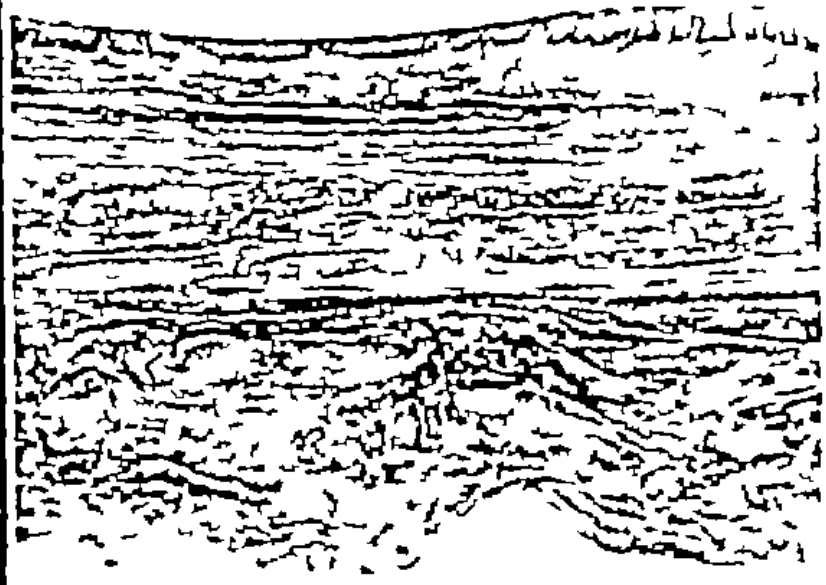


Fig. 10 (above) Specimen of œsophagus and newly formed tube 7 months after operation Stricture narrowing lumen by one-fourth normal diameter is shown, with dilatation above

Fig. 11 Same specimen filled with water bringing out in contrast site of stricture which corresponds to that of the former œsophageal fistula.





Contraction of
in color from

reconstructed
s The newly

formed epithelium l similar to normal epithelium Junc tion point is indicated by ending and intermingling f muscle bundles The thickness of the newly formed œsophageal wall is the same a that of the adjacent œsophagus

As far as the actual reconstruction of the œsophagus by a granulation tube is con cerned we believe the difficulty would not be as great in the human being as in the animal experiments In the latter there was always the problem of controlling the animal and of retaining the implanted tube for the desired period It proved impossible to pre vent the swallowing of all sorts of septic material even in the presence of a gastros-

follows Following gastrostomy the first stage of the operation would be the exposure of the cancer of the thoracic œsophagus through the posterior mediastinum by the extrapleural approach as described by Lilien-thal An operable condition being found the portion of the œsophagus bearing the tu mor is isolated from surrounding structures including the vagi the branches entering the neoplasm being sacrificed The isolated seg ment is surrounded by a sling of rubber dam on the outside of which packings are placed The wound is left open in large part or com pletely Superficial packings are changed when necessary but deep packings are left undisturbed unless there is evidence of infection in the wound It may be mentioned in passing that mediastinal suppuration can be present without clinical evidence for in a case in the experience of one of us (H \ ) in which the above described first stage operation was done a walled-off collection of pus in the mediastinum was unexpectedly encountered at the second stage operation performed one week after the isolation of a cancer of the thoracic œsophagus At the second stage operation the section of the œsophagus would be drawn toward the surface of the wound by traction on the rubber dam The œsophagus would be divided above and below the neoplasm not straight across but obliquely with the idea of reducing stenosi of the divided ends A soft rubber tube would be chosen with a diameter of the filled œsophagus One end of a long strand of silk would be fastened to the tube the other end being brought out of the mouth and strapped to the cheek. The rubber tube would extend about 4 centimeters up and down into the œsophageal ends, and fixed to the wall of the œsophagus by sutures of

chromic gut passed transversely to œsophageal axis, with knots tied on the outside Packings would be loosely placed about the rubber tube and the wound would either be partly sutured or left wide open

This technique of rubber tube implantation would appear to be applicable only to œsophageal resection below the level of the arch of the aorta, and would probably have to be modified for tumors opposite or directly above the arch In a patient operated upon by one of us (H N) in whom the neoplasm lay directly above the arch, the tumor bearing portion of the œsophagus was isolated and the œsophagus stripped free up to the root of the neck It was then divided below the neoplasm and a rubber tube sutured in place The wound was packed with gauze and left open The patient died of hæmorrhage from an intercostal artery 9 days after the first stage operation It was planned at the second stage to expose the œsophagus in the neck draw the tumor bearing portion into the cervical wound, divide the œsophagus above the growth here, draw rubber tube into neck and suture it to the upper œsophageal stump

Clinical experience will, of course, be necessary to determine if results similar to those noted in the animal experiments can be obtained and whether a one or two stage operation will be required From our studies, however, we believe it justifiable to advocate the reconstruction of short œsophageal defects such as those encountered in resection for cancer, by the granulation tube method we have devised

SUMMARY

A simple experimental method has been devised in which a granulation tube is employed for the reconstruction of the œsophagus after its resection

Fatal mediastinal infection follows its attempt in one stage.

The two-stage operation is successful In the first stage the section of œsophagus to be removed is isolated and in the second stage it is resected and a rubber tube is implanted

A granulation tube forms with epithelial overgrowth from the œsophageal ends beginning in one week and becoming extensive at the end of 3 weeks

The longest period of observation was 7 months after operation In this case the new formed tube was well developed and completely lined by œsophageal epithelium A partial stenosis appeared soon after operation but was not progressive.

The method is advocated as applicable for reconstruction of the œsophagus after resection for cancer

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TOTAL REMOVAL OF THE SCAPULA FOR PRIMARY GIANT-CELL SARCOMA

By BYRON B DAVIS, A B M D F A C S Omaha, Nebraska

COMPLETE excision of the scapula was first done in 1855 by Langenbeck The chief indication for the operation is sarcoma and since this neoplasm rarely occurs primarily in the scapula, the number of excisions has been few As regards the rare incidence of sarcoma of the scapula the figures of Coley are illuminating In 1910 he reported 251 cases of bone sarcoma that had come under his observation, distributed as follows

Femur	117
Humerus	54
Tibia	40
Fibula	8
Radius	12
Ulna	7
Clavicle	
Metacarpal	2

His list does not contain a single instance of sarcoma of the scapula John B Murphy in 1915 showed a case in his clinic of sarcoma of the scapula, for which he did a total excision and at the time he gave the distribution of 797 cases of bone sarcoma, as follows

Head	23
Jaw	227
Thora	20
Scapula	23
Clavicle	3
Humerus	90
Radius	90
Ulna	5
Hand	19
Ilium	17
Sacrum	6
Femur	160
Tibia	100
Fibula	25
Foot	29

This table gives only 23 cases of sarcoma of the scapula in 797 cases of bone sarcoma, making its incidence a little less than three-tenths of one per cent

For his inaugural address as president of the American Surgical Society in 1909 Nancrede chose for his subject End Results after Total Excision of the Scapula for Sarcoma All the cases he could find records of at this time in the world's literature were 65 and of the whole number only 1 was nearly certainly cured In the face of this appalling mortality Nancrede concluded that in the future he would recommend interscapulothoracic amputation in preference to total removal of the scapula

Fowler in his *Treatise on Surgery* says that in a fortunately early case of sarcoma of the scapula there is a possibility of a successful excision but the instances must be few and far between in which such a course would not be followed by recurrence

September 5 1921 Mrs F C age 27 consulted me for an enlargement of the left shoulder blade She gave the following history

She has had measles, small pox, and whooping

against any object For about a month after this occurrence, when exercising her arm, she experienced pain over the left scapula At the end of a month

after this, when doing housework, she noticed, at times, pain over the scapula.

While going down the cellar stairs, December 22 1920 she tripped and threw out the left arm to catch herself and there was a sudden sharp pain in her left shoulder blade The pain lasted about 5 minutes. The pain immediately subsided, and she forgot all about it until 6 days later while

inches wide She consulted a doctor who told her she had a fracture of the left scapula, but gave her no treatment During the next few weeks, the swelling extended more posteriorly From this time on she had occasional pain when she moved her arm vigorously

At Easter in 1921 she burned her finger and jerked her arm away and there was severe pain over the scapula for a few minutes and soon it



Fig 1 Roentgenogram showing tumor of the scapula.



Fig 2 Gross specimen of tumor of the scapula.

became more swolle
Lincoln Nebraska,
the swelling Und
mass diminished in
a month she found it was growing again.

In June 1921 a roentgenogram was taken and she was again told she had a fracture of the scapula Since Easter there has been pain over the scapula whenever she uses her arm

In August 1921 she consulted a surgeon, another X ray was taken, and the diagnosis of sarcoma of the scapula was made for the first time

My physical findings at this time were as follows The body of the scapula is very much enlarged and rounded, making it very prominent the mass being at least 3 inches possibly 4, in thickness The skin is movable over the mass and the scapula is freely movable over the chest wall. The mass is only fairly firm in consistency and crackles slightly when pressed The range of motion of the arm is only slightly limited There are a few superficial dilated veins coursing over the tumor The X ray indicated a sarcoma of the body extending up along the anterior border to but apparently not including the glenoid cavity Clinical diagnosis sarcoma of the body of the left scapula. Removal of the scapula was advised and she entered Immanuel Hospital, September 9 1921

Operation September 12 1921 Drs Herbert Davis O E. Olson and E K Eskildsen assisted and Dr J S McAvin gave gas and ether An incision was made from the inner border of the axilla outward along the course of the coracobrachialis muscle The axilla was opened, its anterior fold retracted forward and the tip of the coracoid process reached with the finger The pectoralis minor considerable distance from their attachment to the coracoid process The subscapular artery and vein were made easily accessible and were ligated doubly and cut between and the axillary wound packed with gauze.

To make the field of operation accessible for the next step the patient was turned on her right side An incision was made from the superior angle of the scapula, along the vertebral border to the lower



Fig. 1.—Photomicrograph of section of tumor removed.

angle. Another incision was carried from the tip of the acromion process along the spine of the scapula

muscle was now cut away from its attachment to

bone. The latissimus dorsi was found to be attached to the lower angle by a few fibers, which were divided and following up the anterior border the teres major and minor muscles were both cut. The

muscle.

The lower angle of the scapula was then raised from the thoracic wall and everything loosened from behind them passing upward the levator anguli scapulæ and the omohyoid muscles were cut. At this point both the descending branch of the transversus colli and the transverse scapular arteries were cut and tied. The deltoid was now separated from all its scapular attachments and the acromion process was disarticulated from the clavicle. The humeroscapular joint was then opened and the humerus separated from the glenoid cavity. The long head of the biceps and the long head of the triceps were divided, after which the coracoid process was freed from what attachments remained.

After tying all the bleeding points a running suture of catgut was used to gather a mass of muscles about the head of the humerus in such a

the patient was turned on her back and the axillary wound closed leaving a small rubber drainage tube. The wound was dressed, the elbow being kept abducted somewhat away from the chest wall.

There was some shock from which patient had fully rallied within 6 hours. The muscles were all divided almost an inch away from their attachments to the scapula. As the operation proceeded it was remarked how little trouble was experienced from hemorrhage. Sir W. Watson Cheyne was the first to recommend preliminary ligation of the subscapular artery and it seems an excellent procedure. The most difficult part of the operation as usually done is separation of the coracoid process by dividing the three muscles attached to this process through the axillary wound the operation is much simplified.

September 18 the patient was able to brush her teeth, using the left hand to hold the tooth brush and she sat up for the first time.

September 19. Sat up 2 hours during the forenoon and is feeling fine.

September 20. Combed and arranged her hair. She was encouraged to use the hand in every way possible several times daily.

Discharged from hospital and recommended to exercise the arm as much as possible without discomfort.

The following

now and the result is also much better. The grip

was 80x grams with muscles

the wall. Its consistency was soft almost fluctuant in the center with a few spicules of bone palpable. It was enclosed in a definite capsule except at the inferior angle and below the glenoid fossa, where reddish granular tumor tissues appeared.



Fig 4 Photograph of patient after operation showing scar and patient s ability to raise hand above head

"Microscopic examination of one of these granular areas showed a very characteristic giant cell sarcoma Three types of cells were present

removal was sufficiently wide so that no tumor tissue was incised. This type of tumor is considered relatively non malignant as it rarely metastasizes and complete removal usually results in a cure. The only questionable areas were two places where the tumor appeared to have broken through the capsule

As far as it has been possible to ascertain in a rather extensive search of the literature, this is the first case of unquestioned giant-cell sarcoma of the scapula yet reported I am free to admit that before the case was operated upon, it was not certain what type of sarcoma we had to deal with though, from the history and the rather slow development it was felt there was good ground for considering it a mildly malignant growth and entertaining a lively hope that it was a giant cell tumor

It is I believe to Nélaton that we are indebted for first fully establishing the benign course of giant-cell sarcoma, and the good results of conservative treatment. But the careful observations of Bloodgood andthe fearlessness with which he has put the conservative treatment of this class of cases on a workable basis have done much to standardize our knowledge The last report of his I have been able to obtain gives 47 cases of benign giant-cell tumors in which the ordinary features of malignancy were absent.

Coley has been working on the same line, but in his 40 cases of giant-cell sarcoma, the *diagnosis being confirmed by leading pathologists* 8 have died of metastases

The gross appearance of these tumors is variously described as "reddish jelly like tumor masses resembling granulation tissue," "rather soft and, on section, resembles splenic tissue, or even currant jelly" They pulsate and even after they have absorbed the bone and broken through in places the true giant cell tumor shows no disposition to infiltrate the soft tissues

Histologically this species of sarcoma consists of giant-cells so numerous and so uniformly distributed as to give a characteristic appearance under the microscope

These giant multinuclear cells are not the sole cellular elements of which the tumor consists There are also round or spindle cells grouped around the giant cells which vary in size and shape They are usually round or oval, sometimes having a uniform margin and sometimes being very much broken in outline with protoplasmic masses extending out from the main body of the cell

Several surgeons and pathologists notably Bloodgood Coley and Platou take the position that these giant-cell tumors are alway permanently benign and that it is entirely justifiable to treat them conservatively by curetting out the soft tumor tissue mass or doing a conservative resection of the bone, or if very extensive, an amputation may rarely be required Others are not so certain. Ashhurst seems to take the ground that although the real giant-cell sarcoma does not metastasize it may occasionally undergo sarcomatous change when it begins to grow rapidly and recurrence is usual. Even Ewing who holds to the benign character of giant-cell sarcoma admits that as the spindle cells of the stroma become more active and abundant the giant cells diminish the resemblance to granulation tissue is less in evidence, and the tumor comes more and more to resemble a spindle-cell sarcoma When this point is reached local recurrence destruction of bone and infiltration of soft tissue occur but Ewing has never known such growths to metastasize

The exact line of separation between the entirely benign giant-cell tumor and the sarcoma with a superabundance of giant cells, which does infiltrate which does form metastases seems yet somewhat imaginary and there seems to be some danger of ultra conservative treatment being carried too far

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STREPTOCOCCUS SCROTAL AND PENILE GANGRENE[1]

By MEREDITH F CAMPBELL, M.S. M D New York
Resident Urologist, Bellevue Hospital

ACUTE fulminating gangrene of the scrotum and penis is a disease characterized by an abrupt, spontaneous onset a rapidly ensuing inflammation with marked œdema, and subsequent necrosis of the superficial tissues of the genitals The condition is usually accompanied by generalized sepsis and prostration In private practice the disease is rarely if ever encountered Indeed it is rarely seen except among patients of the large city hospitals Physical debility associated with a variable degree of bodily filth is more frequent in patients of these institutions and may in a measure bear relationship to the occurrence of the disease. During the past 6 months we have observed clinically and studied bacteriologically 5 cases admitted to the Urological Service of Bellevue Hospital These investigations revealed a streptococcus hæmolyticus in each instance as the probable causative agent. This finding substantiated by the clinical picture leads us to believe that the disease is closely akin to the syndrome of erysipelas.

CLINICAL FINDINGS

A spontaneous, extensive tumefaction of the scrotum and penis occurs Frequently these may become three four and even five times normal size The involved parts are exquisitely painful hot, and the skin is tense shining and sensitive Redness may extend to the lower abdominal wall. There is, however no sharp line of demarcation Considerable œdema soon develops Within the next 36 to 72 hours the glazed skin becomes a dull red a superficial watery exudate appears and in the more dependent portions there is the brownish or greenish tinge of early gangrene This gangrenous process may often begin in several places simultaneously especially on the lower parts of the scrotum or on the pre

[1] From the Urological Service, Bellevue Hospital

puce and skin immediately behind It spreads rapidly toward the groin rather than toward the perineum a characteristic distinguishing it from the gangrene of so-called urinary extravasation

Soon as in other types of gangrene a line of demarcation is established beyond which the process will not extend The gangrenous areas if multiple coalesce to form one gangrenous mass Two of our cases (4 5) are unusual in that the infection extended posteriorly to both ischiorectal fossæ with a necrosis of all the superficial perineal tissues The patient is likely to die before the gangrene extends upward beyond the pubic region though it may reach the umbilicus Involvement of the penis does not extend beneath the sheath of the corpora cavernosa Involvement of the testicles and cord is limited by the sheath and tunica vaginalis Sloughing of the testicle does not occur In two of our series (1 4) there was partial sloughing of the tunica vaginalis The skin of the thighs is singularly exempt from involvement In neglected cases, during the 4 or 5 days succeeding onset, the definitely demarcated, sloughing gangrenous mass emitting the characteristic stench of decaying flesh, separates Removal of the scrotal tissues by necrosis or the knife leaves the testicles dangling unprotected between the thighs Some have noted crepitation of the tissues, we have not The condition is in no sense a venereal disease and is accompanied by no urinary disturbances

SYMPTOMS

Many writers have remarked of the sudden onset of systemic symptoms—chills fever nausea vomiting prostration and delirium While some of our patients were septic in the others the contrast between the excellent general condition and the intense local reaction was most striking An acute fulminating onset—designated "explosion by Fournier—with a rapidly ensuing moist gangrene of the involved tissues, appearing spontaneously has characterized our series of cases It was not at the onset that our patients manifested symptoms of toxemia but rather after the gangrenous process was evident—an absorption intoxication

ETIOLOGY

Of paramount interest is the etiology and pathology of the disease According to Whiting (1), the most probable predisposing factors to scrotal gangrene are (1) the laxity of the cellular tissue which permits marked infiltration and (2) the looseness of the skin which diminishes resistance to infection Age apparently is no factor the youngest case on record being 2 years old (Marcy), one of our patients was 71 Trauma has been considered by some but an analysis of case records shows it to be singularly lacking in most instances It is possible that concomitant lesions as urethritis, bubo, phimosis, etc, may afford a portal of entry One patient told of an intense penile itching for relief of which he resorted to scratching with the finger nails Soon thereafter, a malignant infection appeared but it is reasonable to suppose the itching was an early manifestation of a highly virulent infection not yet grossly evident It is conceivable that the organisms may be introduced by clothing friction

BACTERIOLOGY

Clinically and pathologically the condition seems to be a cellulitis the onset manner of extension, the red, painful, hot and œdematous nature of the lesion being characteristic of such a type infection Most observers have felt that there must be a definite causative organism and consequently a number of bacteria have been accused as the etiological agent Thus, the Klebs-Loeffler bacillus, the spirillum of Vincent's angina, an aerobic diplococcus, various anaerobic organisms a pseudodiphtheria bacillus bacillus aerobus septicus, bacillus aerogenes capsulatus, and the streptococcus have been arraigned More recently a *pseudo-Ducrey* bacillus has been included The wide variety of organisms mentioned is evidence of their undetermined relationship to the disease

In all of our cases recently studied direct smears were made through the cauterized skin surface before incision and all showed a long chain variety of streptococcus In four

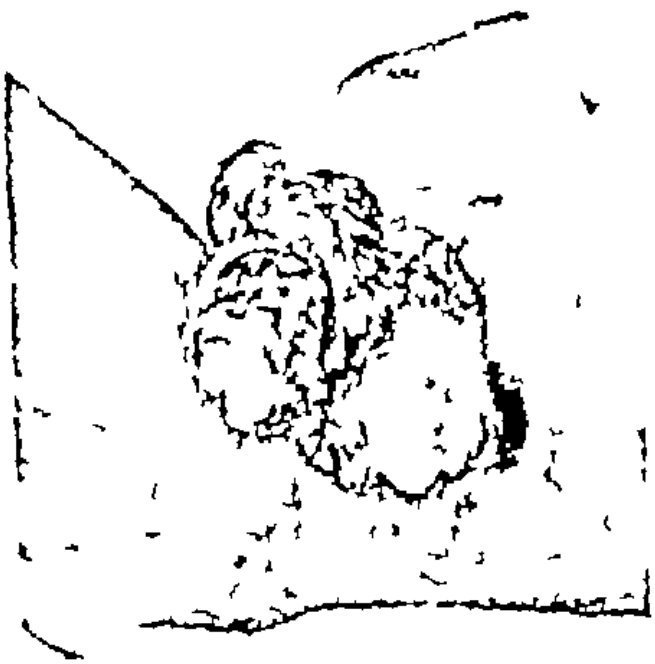


Fig. 1.—Case 1. Partial denudation of testicles and penis, 3 days after operation.

of these cases the material so obtained was plated on blood agar and after 48 hours pure cultures of streptococcus hemolyticus were obtained. In view of the constancy with which we encountered the organism and the association of erysipelas of the face and arm with the scrotal gangrene in one of our patient (the erysipelas succeeding the scrotal condition by 4 days with an admissible history of transmission to and inoculation of the face by the fingernails after having scratched the scrotal tissue) it seems entirely reasonable to suspect that this so-called idiopathic gangrene may be a cellulitis of the superficial tissues not unlike erysipelas.[1] A search of the literature reveals but 6 cases of scrotal erysipelas, the onset and course of the disease coinciding well with that of idiopathic gangrene,[2] all being followed by necrosis and sloughing of the involved parts. Finch (3) has reported an instance of scrotal erysipelas followed by gangrene as a result of infection produced in tapping a hydrocele. Such a sloughing gangrenous erysipelas of the penile skin occurred in the wards of the famous surgeon Nelaton following a trifling incision of the frenum. It seems reasonable therefore to consider these cases as intimately allied to erysipelas if not typically the condition itself, the presence of the hemolytic streptococcus of the streptococcus longus type being corroborative.

PATHOLOGY

Grossly the penis and scrotum appear as previously described. On incision the subcutaneous tissues are yellowish or brownish-green color depending upon the degree of necrosis and are bathed in edematous exudate, great quantities of fluid escaping as the tissue is sectioned. These tissues are somewhat friable and are easily torn or separated by finger dissection. It is noteworthy that the vessels everywhere show thrombosis, bleeding being encountered only when tissue relatively free from involvement is cut. The generalized thrombosis explains the gangrenous changes. Pus pockets are not uncommon beneath the penile skin, lying upon the sheath of the corpora cavernosa. In some instances this burrowed up under the lower abdominal skin, this being tougher and more resistant to the invading process. In one instance pus burrowed along the spermatic cord into the inguinal canal.

Microscopic examination of involved tissue reveals only areas of partial and complete necrosis. Polymorphonuclear infiltration is abundant throughout. The vessels show thrombosis.

DIFFERENTIAL DIAGNOSIS

The condition which most closely simulates this form of scrotal gangrene is that called urinary extravasation, a gangrene of scrotum and perineum secondary to periurethral suppuration and usually associated with stricture. It is it borne in mind that the urethral sclerosis does not necessarily obstruct the passage of instruments of moderate size careful history and local examination will usually reveal the urethral origin of the extravasation while operation always discloses it. The absence of

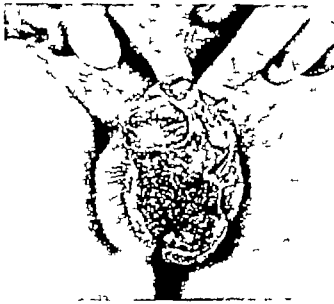


Fig. 2 Case 1 Appearance 5 weeks after operation. There is some distortion of the penis which, however is not evident in the picture

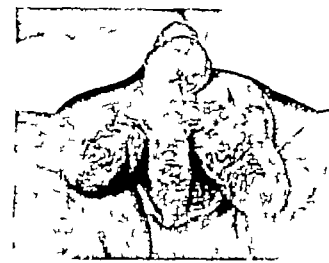


Fig 3 Case 3 5 days after excision of involved skin areas Marked induration of the scrotal septum is to be noted, a portion of this structure having been removed

sation Acute periurethral abscess scarcely simulates scrotal gangrene, for it is not associated with gangrene Passive œdema of the scrotum due to nephritis cardiac insufficiency, hepatic cirrhosis Asiatic cholera, smallpox chronic alcoholism, diabetes etc may well be mistaken for streptococcus gangrene at first glance for the two conditions occur in patients of a similar type and the œdema may simulate the gangrenous process quite closely in its rapid onset and great swelling We know of a case of œdema that was operated upon under the mistaken diagnosis of urinary extravasation The gangrene of diabetes especially should be considered because of the striking clinical similarity of the two conditions

PROGNOSIS

Whiting (1) collected 93 reported cases from the literature of which number 23 died a mortality of 23 5 per cent Coenen and Przedborski (4) found 145 cases among which there was a mortality of 22 1 per cent Of the 5 cases here reported 1 died A mortality of 20 to 25 per cent is therefore apparently to be expected The prognosis seems to depend upon the severity of the toxæmia The urine of two of our patients was studied several times but showed no evidence of toxic albuminuria. In no case was sugar found Emery (5) speaks of the "mode of termination of the disease by a cure' and in our series all recovered readily save one who developed metastatic erysipelas

TREATMENT

The treatment is surgical A review of the earlier therapy is most interesting Apparently the entire pharmacopeal armamentarium was utilized glycerin belladonna bichloride of mercury various dusting powders etc., were administered interchangeably Once castration was the recognized procedure a regeneration of the scrotal tissues being deemed impossible So common was this procedure that a physician near Boston reported a case under the title "Gangrene of the Scrotum in Which the Testicles *Were Not Removed*' We *now* recognize that the testicles and their enveloping sheaths should be left intact Some have questioned the wisdom of free and early incision Such incision has been our routine procedure thus permitting proper surgical drainage If there is extensive involvement whole masses of scrotal skin have been excised If there is involvement of the penile skin it too is removed as far back and extensively as seems indicated since we are aware of the surprising regenerative powers of the skin of these parts Anæsthesia is by no means always necessary, much of the involved tissue being insensitive Hot potassium permanganate 1 500 *applied continuously* serves as



Fig. 4. Case 4. Picture taken 2 days after operation. This patient developed erysipelas of the face and right arm 2 days later. There was marked extension along the penis later the lower abdominal wall became gangrenous.



Fig. 5. Case 5. Three days after operation. The most unusual complication of extension to the buttocks with subsequent sloughing of the superficial perineal tissues is noteworthy.

an antiseptic and deodorant. We employ it both as a dressing and irrigant.

As soon as the patient has recuperated sufficiently from the excision operation he is given a daily bath for an hour in a tub of hot water. This has proven most beneficial serving admirably to cleanse the wound thoroughly. Once the slough is removed the rapidity with which the granulation tissue forms is astounding. Various plastic operations have been suggested but if one will adhere to the rule of keeping the testicles well against the perineum, the scrotal tissue will be found to regenerate over them and operations will rarely be necessary. No plastic operations have thus far been necessary in our series. If there is much cicatrix formed about the base of the penis there is of course danger of chronic oedema of the glans. A moderate oedema was noted in one case but has called for no treatment.

CASE REPORTS

Case 1. W. B., ticket agent, age 29 years, was admitted to the Urological Service, Bellevue Hospital, March 14, 1921, complaining of swelling and pain in the penis and scrotum. Duration 2 days. Onset sudden and rapidly progressive, accompanied by chills, fever and some prostration. Temperature on admission 103.5. Gonorrhoea 15 years ago. No complications. No urinary disturbances. On admission penis was 6 times normal size, scrotum 4 times normal size and both red, glazed, tense, edematous, and exquisitely tender and painful. The penile skin was blackish in some parts but that of the scrotum showed no evidence of gangrene. There was no perineal infiltration. Testicles and epididymes were not made out. Some induration of the groin. A No. 26 F. sound was passed easily to bladder. Under 2 per cent. novocain a dorsal slit was made and prepuce retracted, it being thought at first that a preputial lesion might be present. None was found. The next day the entire penile and scrotal skin was removed under general anaesthetic, and permanganate dressings (1:500) applied. At operation a partial necrosis of the right tunica vaginalis was noted and the greater part of the tunica was excised. Smears showed a great number of long chain streptococci but no culture was made on blood media.

During the succeeding week great quantities of slough separated and in 10 days fresh granulations were evident. Blood cultures taken the day following admission were sterile 48 hours after. The temperature oscillated about 103 for nearly a week and then came to normal, the signs of toxemia gradually disappearing. The patient remained in the hospital 4 weeks at the end of which time scrotal and penile skin regeneration had progressed rapidly. There was, however, some distortion of the parts by the newly formed scar tissue.

Case 2. M. D., a street cleaner, age 58, was admitted to Bellevue, April 4, 1921. Complained of swelling and soreness of the penis. Three days previous to admission he noticed an itching of the distal portion and scratched the part. Rapidly the penis became red, hot, swollen and tender. On admission the entire penis was about twice normal size, markedly inflamed with gangrene and sloughing of the entire ventral half. On the dorsum there were three pea-sized areas of necrosis. The patient thought that these might have been caused by scratching. Smears showed a long chain streptococcus which when plated on blood agar caused hemolysis. Venereal disease was denied. No urinary disturbances

A dorsal slit was performed and the organ put in a wet dressing of permanganate 1 500 which was changed twice daily considerable slough being removed with each dressing Two weeks later patient was circumcised such tags of tissue as remained being removed He was discharged at the end of 3 weeks wounds healing well but had not returned since and has been lost sight of On admission the temperature was 99 The day after circumcision it rose to 102 falling the next day to normal and remained so throughout his stay in the hospital

CASE 3 J K. a laborer age 60 was admitted to Bellevue Hospital May 11, 1921 with pain and swelling of scrotum and penis. Onset was gradual 2 weeks previous to admission, with increasing redness, pain and swelling of the parts. No history of *trauma or infection* No urinary disturbances Examination revealed an acute inflammation of the penis and scrotum, the dependent portion of the latter being in ear
The scrotal lesion
made by punctur
showed long chain streptococci in great numbers On blood agar hæmolysis was produced A No 19 F sound passed easily to the bladder and prostate was found to be normal. Urine examination was negative The next day under local anæsthesia the entire scrotal sac with most of the scrotal septum (all found to be involved) was removed Bleeding was stopped with hot permanganate dressings. On the left pus was found to extend up the cord stopping about an inch inside the external ring At no time were the systemic symptoms of toxæmia marked and within 48 hours after removal of the dead tissue the patient felt improved On admission the temperature was 101 but dropped to normal in 36 hours and remained so throughout the succeeding course of the disease On discharge 4 weeks later the scro
rapidly,
a month
covered
scarring about the base of the penis causing some chronic swelling and œdema of the glans This condition caused no discomfort however

CASE 4 J M., a porter age 50 was seized with a sharp pain localized in the lower right quadrant shortly after a meal He vomited several times, took a cathartic with good effect and came to

ness The next day the scrotum was found to be swollen and red said to be suspicious of erysipelas The following day it was the size of a grapefruit and at the lower pole showed areas of early gangrene The penis too showed involvement being acutely inflamed and twice normal size There were no urinary difficulties and a No 20 sound passed to the bladder without difficulty On this date a direct smear through the cauterized skin was made and found to show streptococci in great numbers. On blood agar these organisms produced hæmolysis That afternoon (May 21 1921) all the scrotal and

into the ischiorectal fossæ where large pus pockets were found. (Subsequently the perineal tissues sloughed away) Because of collections of pus burrowing beneath the penile skin, practically all of this tissue was removed On the left a small patch of gangrene of the tunica vaginalis was discovered This was excised leaving the testicle naked Three days later marked tenderness, redness and œdema *of the nose was noted the lesion extending some* what in butterfly design to the cheeks The patient began to have pain about the mouth The right elbow and upper arm also were red and œdematous more especially the elbow The margins were sharply defined and elevated The patient gave a history of scratching his face and arm after having scratched the primarily involved tissues On May 27 the skin over the lower abdomen was red and indurated Permanganate dressings were applied Much slough was removed from the scrotal lesions. That night the patient became irrational tore off the dressings, and had to be restrained. Two days later the cellulitis of the arm was found to be extending
Tha
eml
93 per cent of which were polymorphonuclears The temperature on admission was 104 and varied little during the course of the disease

CASE 5 A F a peddler age 61 was admitted to Bellevue Hospital May 24 1921 complaining of

on the former Rapidly these symptoms increased in severity but there was no marked systemic reaction On the day of admission to the hospital, these organs were found to be about three times normal size showing all the evidences of an acute inflammatory process with patches of gangrene at the lower pole of the scrotum Near the prepuce two brownish areas of early gangrene were noted The *skin redness was in no sense demarcated* There was no enlargement of the inguinal lymph glands nor was there any difficulty of urination. A No 26 F sound passed readily to the bladder and rectal examination revealed no abnormality of the prostate

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showed a hæmolytic streptococcus of the long chain variety Under local anæsthesia the penile and

scrotal skin was removed and long incisions were carried posteriorly into the buttocks, gangrenous tissue and many pus pockets being encountered throughout. Hot permanganate dressings and daily hot baths constituted the further treatment, the slough being cut away daily. Two days after the primary incision the perineum came away, this

ing rapidly. He has not returned for observation.

CONCLUSIONS

1 Acute streptococcus penile and scrotal gangrene is a clinical entity readily distin

infection of the skin and subcutaneous tissue comparable to erysipelas.

3 Like erysipelas it spares the underlying structures.

4 Unlike erysipelas it is characteristically a gangrenous process though gangrene is not unknown in erysipelas elsewhere in the body.

5 Mortality is between 20 and 25 per cent.

6 Spread of the disease may be controlled by excising gangrenous skin and draining gangrenous and suppurating subcutaneous tissue.

7 Regeneration of scrotal skin is rapid.

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CALCULI WITHIN THE BRAIN

REPORT OF A CASE OF INTRACRANIAL CALCIFICATION WITH SUCCESSFUL OPERATION AND RECOVERY[1]

BY ELI A. MILLER, M.D., DENVER

INTRACRANIAL calcification is encountered but rarely in the practice of medicine as indicated by an examination of the literature. An exhaustive study of the subject was recently made by Heuer and Dandy who found up to 1916 there had been but 7 cases reported all by foreign observers.

Lichtheim had demonstrated a calcified gumma. Fittig observed by roentgenological examination three calcified areas in cyst walls in the occipital lobe of a brain. Grunmach noted a shadow due to a calcified tumor of the pineal gland. Schuller reported an osteoma in the frontal region. Algyogi a basal tumor with areas [illegible] tumor in th a calcified c brain abscess recognized after its disclosure at operation.

Heuer and Dandy reported 6 cases of their own found in a study of one hundred clinically demonstrated brain tumors as follows. One case of calcification of the brain substance one of calcification in the sella one of an eurism of the internal carotid artery and two cases of calcification above and very close to the sella.

Subsequently George reports the case of a man 23 years old in whom stereoscopic examination of the head made in the lateral position showed an area of about 3 centimeters in diameter posterior to the sella with apparently calcified walls. The patient had been injured in the head while playing football and rendered unconscious. He subsequently developed epileptic attacks which persisted for 18 months, when an operation was performed which revealed a small tumor situated just below the pia mater and adherent to the midfrontal lobe diagnosed as an encapsulated glioma.

J. T. Murphy reports the case of a woman age 47, in whom the X ray showed a series of fine calcified lines each forming a part of a circle which was seen to be above and behind the sella and about midway between the left side of the skull and the median line the whole making a barrel-shaped shadow. The

[1] Read before Denver County Medical Society, November 5, 1917.

exact diagnosis was not clear to the writer but he seemed to think that it was either a cyst of the brain or an aneurism of the anterior cerebral artery His patient suffered with paralysis of the right arm and leg there was a disorder of the faculty of language, drooling from the right side of the mouth, convulsions and headache The patient was placed on small doses of iodides She improved greatly Most of the symptoms subsided only a small facial paralysis remaining

Bassoe and Hassin give a detailed clinical and histological report of a man age 32 in whom there was calcification of cerebral vessels with a clinical picture simulating brain tumor Histologically there was an indurated area measuring about 2 by 3 centimeters, occupying the basal ganglions and centrum semiovale It was ill-defined, merging into the surrounding normal tissue, and it was in this area that microscopic, pale, calcified, bodies were present They conclude that the white substance of the brain may be the site of a peculiar degenerative process followed by calcification The lime deposits originate in the tissue spaces which primarily show a hyaline or colloidal degeneration as the result of some metabolic disorder The degeneration results in defective drainage of the tissue fluids which become stagnant and ultimately calcified

True bony tumors (osteoma and osteosarcoma) or tumors which have undergone calcification or ossification, cast shadows on the X ray plate that can be readily recognized, nevertheless a search of the literature reveals less than twenty recorded instances

The case described here differs markedly from those found in the literature in that the roentgenological examination reveals shadows which have the appearance of stones or calculi within the brain substance and these were successfully removed at operation

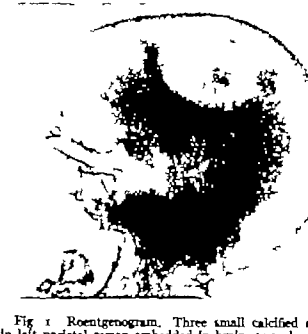


Fig 1 Roentgenogram. Three small calcified areas in left parietal region embedded in brain two about ¾ inch deep, and one about 1 inch deep

Mr F A D age 60 a gardeman by occupation presented himself October 10 1921 for the relief of epileptic attacks, which had become more severe and more frequent recently he had had from three to five attacks a night during the previous week.

The patient had usual childhood diseases including measles, and scarlet fever 12 years of age of appe

this attack he had been confined to bed for over 6 weeks, and was very seriously ill with a high fever and a marked swelling in his right side He had no trauma and denies venereal disease He uses neither alcohol nor tobacco

About 26 years ago the patient had his first

awakened from a sound sleep by a terrible grinding sensation in his head over the left parietal region and there was a slight twitching in the fingers of his right hand also there was vertigo faintness, and sudden visual sensation followed by cloudiness of consciousness.

Subsequent attacks occurred at intervals of about a year or year and a half in the following 10 or 12 years Then he had the attacks more frequently In 1913 he was having an average of two attacks a month He was operated upon by Roswell Park at Buffalo General Hospital in June, 1913 A trephine was performed a tumor in the left parietal region was suspected nothing, however was found and the attacks returned a few weeks after operation. In the last 2 years he was subject to two or three spells within a few days and then he would be free from attacks for a week or more

There is no family history of epilepsy insanity diabetes, kidney or heart disease His father died of cancer of the stomach at the age of 65 his mother died of pneumonia at the age of 56 his wife died following an operation for uterine fibroids. One daughter age 24 is living and well one son age 26 has pulmonary tuberculosis, one daughter died following childbirth at the age of 22

At the time of presenting himself for relief the nt was subject to three to five epileptic attacks

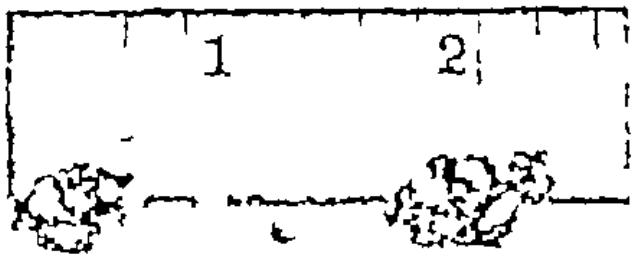


Fig Photograph of calculi Natural size



Fig 3 Enlarged photograph of first stone
Fig 4 Enlarged photograph of second stone

a night These attacks come on for the most part a few h r after going to bed He is awakened suddenly by an aura in which he feels numbness and tingling of the middle and ring finger of the right hand Then these fingers begin to twitch this is transmitted to the thumb the hand flexes forcibly on the forearm and forearm on the arm The right side of the face twitches, later becoming more generalized and the entire body becomes affected with convulsive movements clonic in character He does not cry out in the beginning of the attack, and remains in a state of consciousness throughout the greater part of the attack He has a most distressing awful grinding sensation in his head in the left parietal region and it seems to him ages of torture before he is finally blessed with loss of consciousness He has enough warning to be able to self-administer chloroform which sometimes aborts the attack. Each attack lasts from 20 minutes to half an hour and recurs at short intervals several times during the night During the attack his consciousness is clouded and mental faculties re dulled, but after the attack is over he is normal He has no false sight or hearing during or following the attack

Chest The lungs appear to be normal The heart borders are normal to percussion the second sound in the mitral area is somewhat muffled the cardiac rate is seventy-six and the rhythm is good Examination of the abdomen reveals nothing abnormal. There is a marked paresis of the right hand the grip of the right is very much weaker than the left, although patient has always been right handed. There is some atrophy of the muscles of the right hand

Ophthalmoscopic examination was made by Dr Stillwill who reports that there are no tortuosities of the retinal veins and arteries, that the nerve head is of normal color that the choroidal ring is not distinct and the cornea and iris are clear

The systolic blood pressure is 170 the diastolic 105. A Wassermann test on the blood gave a negative reaction Urinalysis reveals a trace of albumin and an occasional hyaline and granular cast Several subsequent examinations of the urine after the patient was put on increased fluids and the use of chloroform was abandoned, were negative for albumin and casts.

either badly constipated or has severe diarrhoea

Physical examination October 10 1921 The patient is a well-developed well-nourished individual 5 feet 8½ inches in height weighing 176 pounds. His head is round and symmetrical, his ears are

react normally to light and accommodation the eyelids close normally Many teeth are missing

each 1 side on showing teeth or laughing

fluid intake and improved elimination his blood pressure was reduced to 135 systolic and 90 diastolic albumin and casts disappeared from the urine The general condition of the patient was much improved although he was showing the effects of bromides He was beginning to have many minor attacks some of which he could abort by a tight constriction about the wrist.

Operation The patient was operated upon November 5 at St. Anthony's Hospital Denver

Under ether anæsthesia, a semilunar incision over the left parietal region was made beyond the old trephine area down to the periosteum of the skull A large horseshoe shaped flap of scalp was turned down great care was taken in the separation of the scalp from the dura at the site of the previous operation. There were dense adhesions to the dura, but by careful dissection with a periosteal elevator a fine separation was accomplished The dura was fibrous dense, and somewhat tense A curved incision in the dura over the left motor area was made and a flap turned down There was some bleeding from the brain surface but it was easily controlled The surface of the brain appeared normal On introducing a needle into the substance of the brain in the parietal region on a line with the external auditory meatus resistance was felt 1 inch from the surface There was a twitching of the right hand After careful separation of the brain tissue a solid mass was elevated This calculus was crushed by the grasp of the forceps Palpation with a finger in the opening through which the first calculus was removed revealed two other calculi lying posteriorly in a smooth walled cavity These were removed without breaking by grasping them with Allis forceps guided by the finger The cavity in which they were lying was smooth to the touch There was very little destruction of the brain tissue by the operation It was possible to make an excellent closure of the dura and scalp without any bulging of the brain

On postoperative examination after recovery from the anæsthesia the right hand was found to be paralyzed there was no impairment of speech no facial paralysis no paralysis of the right arm and forearm The hand was flaccid with the fingers flexed This condition is improving The patient was given urotropin (hexamethylenetamin) by mouth for 2 days previously and for a week after operation He has had no epileptic attacks since operation

Pathological report The specimens removed at operation are solid calculi grayish white in color irregular in shape, with many projecting nodes like the mulberry One of these measures ¼ inch by ⅓ inch by ⅓ inch the second measures ¼ inch by ⅓ inch by ⅓ inch the third was approximately of the same size but was crushed in removal

Chemical analysis was made by Drs. Hillkowitz and Gauss. They report that the calculi are composed almost entirely of calcium oxalate with organic material probably decomposed blood.

Intracranial calcification may be classified under the following general heads

The first is the calcification which occurs in cyst walls and in the walls of abscess cavities These cysts have been observed both in infancy and adult life Infants showing cyst formation usually present evidence of impaired mental development or a spastic paraplegia. The calcification occurring in adult skulls are usually associated with cysts which are secondary to a fracture of the skull or subdural hæmorrhages

Under the second are grouped the deposits of so-called "brain sand" Among these are the deposit of lime in the pineal body The deposit of brain sand in the falx cerebri, the so-called psammoma, are classified by some pathologists as true bone tumor or osteoma

Under third heading is the calcium deposit in the walls of the blood vessels of the brain

Under the fourth heading is the deposit of calcium in brain tumors and with these are included gummata and tuberculomata

Under the fifth are grouped the true bony tumors osteomata and osteosarcomata.

Finally there is the class of calcified bodies which occur in the white substance of the brain upon the site of a peculiar degenerative process of which Bassoe and Hassin speak. The lime deposits originate in the tissue spaces which primarily show a colloidal degeneration as the result of some severe intoxication with consequent metabolic disorder The degeneration results in defective drainage of the tissue fluids which become stagnant and ultimately calcified It seems to me that this is the probable explanation of the calculi within the brain substance in my case

In conclusion the writer wishes to thank Dr L I Miller, Drs. McCartney and Sams for their kind advice and assistance Drs Childs and Crosby for their roentgenographic studies Dr Stillwill for his ophthalmoscopic examination and Drs Hillkowitz and Gauss for their pathological and chemical studies.

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UTERINE HÆMORRHAGE OF ENDOCRINOPATHIC ORIGIN[1]

By SAMUEL H CHRIST M D F A C S New York
From the Gynecological and Associate in Surgical Pathology Mt Sinai Hospital

THE process of menstruation is dependent on the interaction of the chain of ductless glands and the uterus Whether the uterus can be accepted as a ductless gland is still unsettled The myometrial gland has not been definitely proved to have a constant existence or an internal secretory function We know that the presence of the ovaries alone does not insure the menstrual function but that the absence of the ovaries precludes the advent of this process The presence of uterus and ovaries may not result in the appearance of the periodic monthly uterine hæmorrhage for in some instances, individuals with apparently intact pelvic organs may have no menstrual flow or may have a more or less periodic flow from other body surfaces i e so called vicarious menstruation

We can see from these facts that the function of menstruation depends on other factors than the mere presence of the uterus and ovaries To menstruate normally a woman must have uterus ovaries and the *proper stimulus* from some *other source* which has been hypothetically accepted to be the ductless gland There seems to be no definite gland that elaborates the stimulus though as we have already mentioned the presence of functionating ovaries is absolutely essential

Because of the pathological variations in the menstrual function in many diseases associated with endocrine disturbances such as myxœdema exophthalmic goiter acromegaly dystrophia adiposo genitalis tumors of the hypophysis and adrenals it has been assumed that all these glands play a rôle in the production of menstruation and that variations in the physiology of these glands result in disturbances of the menstrual function In other words the entire chain of the so-called ductless glands is involved in the process of initiating normal menstruation and variations from the normal type must be due to disturbances in one or the other of these glands or in a group of them leading to a flaw in the normal concerted action of the chain

Uterine hæmorrhage aside from the normal periodic bleeding has been in a gross way classified in two large groups (a) due to systemic conditions (b) due to local conditions Under (a) are grouped cardiac diseases diseases of the liver and kidneys anæmia hæmorrhagic diatheses as purpura and the acute infectious diseases as scarlet fever Just what causes the bleeding in these cases other than a local congestion is difficult to state as the description of this symptom and observations of its course and character of its variations in the course of the above described diseases are very meager

Under group (b) we have bleeding due to (a) local inflammatory lesion of the pelvic organs (b) malpositions and displacements (c) foreign bodies (d) tumors of the pelvic organs (e) a condition with no gross lesion but some histological (?) or physiological changes in the uterine wall vessels or ovaries.

The bleeding due to local inflammatory diseases malpositions and displacements or foreign bodies is in most instances scant in amount and in all probability is dependent on the mechanical disturbance to the pelvic circulation or local injury Some of the instances of profuse hæmorrhage may in these cases also be due to some interference with the proper function of the pelvic organs as ovary or uterus. The two subgroups, tumors and non-demonstrable gross lesions, form a topic of great interest. It has been assumed that in cases of tumors of the pelvic organs the mechanical affect of the tumor accounts for the bleeding though no thought is given to the many instances where tumors occupying similar positions as those associated with hæmorrhage as a symptom do not cause bleeding

Bleeding due to tumors can be divided into two types Those in which the hæmorrhage is a purely local manifestation of an erosive or ulcerative condition of the tumor and those

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in which without invasion of the uterine cavity or ulceration of its walls, we have bleeding often of a most intractable nature. The first type is illustrated by the carcinomata of the cervix or uterus Here we have a very friable neoplasm which at the slightest trauma bleeds because of the damage directly done to vessels in the tumor proper This, too is true of other types of submucous growths that have by pressure or degeneration and necrosis opened vessels of greater or lesser size and that bleed because of the direct injury to the vascular channel

The second type cannot be explained on these grounds as they have not opened vessels nor caused erosion of the mucosa nor are they friable or exposed to trauma. Under this heading is the great group of fibromyomata and ovarian and tubal tumors Here the symptom of hæmorrhage is a varying one True in most instances of fibromyomata there is a history of atypical uterine hæmorrhage, but truly not dependent on any local effect in a majority of the cases

In a study of 250 fibroids 192 gave a history of menorrhagia or metrorrhagia irrespective of the size or situation of the tumor Of the 58 that had no menstrual irregularities, there were many that grossly were identical in size and situation with some that were associated with pathological uterine hæmorrhage. This makes it unlikely that purely mechanical factors played a rôle in these instances.

A histological study of the mucosa in these (Fig 1) 192 cases show in 168 a marked hypertrophy irrespective of the phase of the normal menstrual cycle. This was the only constant lesion found It has already been described in detail in a previous paper (1) It might be mentioned here that this change in the mucosa is also a characteristic in cases of uterine hæmorrhage without gross lesions as will be mentioned later and also in cases of ovarian and tubal tumors (Fig 2) accompanied by metro or menorrhagia. We see that it is not the size, shape, mechanical embarrassment to the pelvic circulation nor the ulceration or necrosis of the tumor that gives rise to this atypical bleeding and we must therefore, seek another explanation to



Fig 1 Mucosa from a uterus containing multiple fibroids, bleeding for 3 weeks

account for the phenomenon As we previously suggested in the paper quoted above we must look for the etiological factor in some disturbance of endocrine balance We can also utilize for purposes of argument the similarity between the histological picture of the hypertrophied mucous membrane found associated with this condition and that of the normal premenstrual phase as well as that seen in the cases of so-called "essential uterine hæmorrhage" The reaction of the mucosa in the three types of cases is so similar that it seems reasonable to suppose that the same stimulus namely endocrine activity either the product of one gland (the ovary) for that at least is essential for this change or a group reaction is responsible for the hypertrophy

In view of the fact that removal or raying of the ovaries will cause a disappearance of the mucosal hypertrophy and also a cessation of the hæmorrhage it is proper to conclude that its activity at least is necessary for the two processes and so give weight to the supposition that the hæmorrhage associated with fibroids except in those instances mentioned above as due to local effects is dependent on an endocrine disturbance

The same method of reasoning and the same findings in the mucosa would lead us to



Fig. 2. Mucosa from a uterus in a case of ovarian cyst, bleeding for 5 weeks.



Fig. 3. Mucosa from a case of essential uterine hemorrhage bleeding 8 weeks.

similar conclusions in reference to the hemorrhage associated with tumors of the ovary. Abnormal bleeding is not a common symptom associated with ovarian tumors and it is only in those cases where the function of the ovary is abnormal, resulting in a disturbance in the entire endocrine balance, that this expresses itself in uterine bleeding of an atypical character. Here too the findings in the uterine mucosa would tend to substantiate this theory.

An interesting group of tumors are the uterine polyps. By this term is meant small pedunculated masses composed of endometrial tissue and not pedunculated fibroids submucous in situation. These local growths seem to me not to be true neoplasms but more in the group of local hypertrophies. One finds them often associated with fibroids at times solitary at others multiple. Again they are present with no other lesion except perhaps an hypertrophy (more or less marked) of the mucosa. They are often associated with atypical uterine bleeding either an exaggeration of the normal period (menorrhagia) or sometimes metrorrhagia is present especially if the polyps are ulcerated. It seems rather odd that these growths of the same elements as the mucosa should give rise to the rather profuse hemorrhage that characterizes them at times. The examination of these small tumors grossly and histologically does not offer a rational explanation. They are not always eroded or necrotic. Often they are very hemorrhagic, much more so than the remainder of the mucosa, especially when they protrude through the internal os. They are not malignant they do not grow very large, they do not infiltrate or metastasize though a malignant tumor may develop at their site. There is a tendency for more of them to form when they have been removed by some local procedure. The impression created is that they are the result of some stimulation that produces local hypertrophy instead of the general hypertrophy as seen in the essential hemorrhage type of case or in cases associated with fibroids. They are however often found in addition to the general hypertrophy present in bleeding cases and it seems that the hemorrhage so commonly associated with these polyps is the expression of a general process of which the polyp is just a local manifestation.

In the normal menstrual cycle the uterine mucosa undergoes a periodic variation with an overlapping of the different phases. This was pointed out first by Hitchman and Adler

and has since been corroborated by a large number of investigations The varying phases are well known and need no further gross descriptions

It is still accepted by many medical men that the hæmorrhage one encounters in women who have no grossly demonstrable lesion except a uniformly enlarged uterus is due to a fibrosis, an endometritis or a vessel disease

It has been repeatedly demonstrated that endometritis is a very rare disease except the acute type that follows instrumentation or delivery and that the condition, chronic endometritis, is rarely present in cases that have atypical uterine hæmorrhage, and can hardly be held to be the etiological factor in a condition that is much more conspicuous by the absence than the presence of its supposed cause.

It was pointed out also (2) that in cases of so-called essential uterine hæmorrhage, the one characteristic finding in the uterus was an hypertrophy of the mucosa simulating an atypical premenstrual phase with œdema of the stroma, enlarged, sometimes tortuous almost always cystic glands and this irrespective of the stage of the menstrual cycle (Fig 3) It was suggested that the stimulus that caused the normal changes in the mucosa also caused by some perverted activity, the abnormal condition found in the bleeding cases Furthermore, because we know that these changes do not take place after the removal of the ovaries or the abolition of their functions we advanced the theory that the ovaries are essential for the change in these pathological cases. As we know that the ovaries are essential for the production of the uterine bleeding normal or pathological we conclude that the same factor is the causative agent for the hæmorrhage and for the hypertrophy We see, therefore, that all cases of uterine hæmorrhage not associated with tumors that are ulcerated necrotic or friable or with conditions that may be dependent on purely local pressure or congestive phenomena such as tubal pregnancies, inflammatory diseases or displacements and accompanied by a definite pathological almost pathognomonic, condition of the mucosa are dependent on the presence of the ovaries These findings lead us to the supposition that bleeding and hypertrophy of the mucosa are due to a stimulation dependent in part at least on the activity of the ovary Whether the mucosa itself plays a rôle by the production of a substance or substances that actually precipitates the hæmorrhage and maintains it cannot be stated, but it seems possible that the mucosa in its hypertrophic condition is producing some substance which may be an active factor

Analyzing our cases of hæmorrhage whether due to fibroids, ovarian or tubal tumors or in those cases where no gross lesion exists, we must admit a striking fact that they can all be cured by the removal of the ovaries or by raying in proper dosage and that they all are characterized by the hypertrophied mucosa previously described

In view of this, I feel that it is fair to suggest that all these cases when associated with bleeding have as the etiological factor for their hæmorrhage not the local condition, but some disturbance of ovarian function which may or may not be the only factor involved In all probability it is only one of the glands at fault, the result of this variation being that the entire chain i e., thyroid hypophysis, adrenal and ovary does not functionate normally This abnormal action of the endocrines expresses itself in the hypertrophy of the mucosa which tissue may be the source of some chemical stimulus that initiates and maintains the bleeding

Unfortunately at the present time endocrine therapy is still in the experimental stage and most of the administration of the various products is purely based on empiricism It is to be hoped that eventually we shall have developed a rational therapeusis, and it will be in just these cases of pathological hæmorrhage that much good will be accomplished

I wish to thank Dr F S Mandlebaum director of the Pathological Department for the excellent photomicrographs and for the privilege of studying the material

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DEPARTMENT OF TECHNIQUE

CORRECTIVE RHINOPLASTY

Some Anatomico-Surgical Considerations [1]

By LEE COHEN, M.D., F.A.C.S., Baltimore

THE widespread interest manifested in corrective rhinoplasty during the past decade has finally given to this class of work the real place in surgery to which it is entitled. Some men, however, still maintain an air of opposition on the ground that such purely cosmetic work is unworthy of serious surgical consideration. I take issue with my friend Dr. Beck (1) in his recent "Review of Twenty-five Years' Observation in Plastic Surgery, etc." who would differentiate between patients really requiring operations because of mishap and those with congenital deformities who merely desire operations for cosmetic reasons. As a matter of fact, all plastic operations about the face are, as I see them, for the sole purpose of improving the individual's appearance. No surgeon would refuse to restore form, where possible, to a nose sunken from septal abscess. Why then refuse correction of an equally deformed nose of this type, of congenital origin? Likewise, when a patient is made self-conscious and his entire mental outlook on life is perverted, through the possession of a grossly oversized or humped nose, why should he not be accorded the same privilege of relief?

In the above-mentioned review Beck further emphasizes the element of neurosis and the difficulty in satisfying many of these patients. In my experience, patients with deformed noses are no more neurotic than those with other

be disturbed. The obvious remedy for this neurosis in any case, therefore, is a correction of the deformity. Moreover, the gratitude shown by no class of cases compares with that of patients after the successful performance of these plastic operations; their joy and happiness has to me been a real inspiration.

In this, as in all other surgical procedures widely employed, the most expert cannot always expect ideal results. How much more likely then are utter failures to occur in this tedious and quite difficult field in the hands of some who, after witnessing a few operations, attempt them without anatomical study, practice on the cadaver, or in many instances without even a moderately liberal training in general surgical technique. These same men, with no greater training, would hesitate to perform a major abdominal operation wherein failure might register a death to their credit. In no other field of surgery does close attention to the most minute detail, both in the operation and after dressings, count for more in obtaining the desired result. It seems, therefore, timely here to sound a note of warning to men who contemplate doing this work, and to emphasize the need of careful preparation and study, lest failure crown their operative effort and bring upon them, and upon the work as a whole, the opprobrium of the patient and the profession as well.

In previous monographs (2, 3, 4, 5, 6) almost all types of nasal deformities have been considered by the writer and many phases of the subject discussed, but there are some finer details in technique that might still be brought out.

I would here first present for your consideration the reduction of congenital overgrowth of the cartilaginous nose existing in many instances without deformity of the bony portion. Although this operation may seem trivial compared to some of the more extensive work on the bony nose, the surgeon's judgment is often taxed to its utmost in determining the extent of the incision and how much tissue should be removed.

Figure 1 represents the skeleton of a nose with a markedly oversized cartilaginous portion; not only is it too wide but the tip stands prominently above the dorsum of the rest of the nose. This exaggerated tip is, in the vast majority of cases, due to an overgrowth of the greater alar cartilages, although in some instances the lateral cartilages also take part in a more general enlargement. In

[1] Read before Clinical Congress of American College of Surgeons, Philadelphia, October 26, [illegible]



Fig. 1 Skeleton of nose with markedly overdeveloped cartilaginous portion. Not only is it too wide but the tip stands prominently above the dorsum of the rest of the nose.

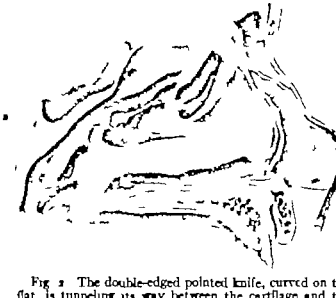


Fig. 2 The double-edged pointed knife, curved on the flat, is tunneling its way between the cartilage and the overlying skin. The knife is introduced from within the nose 3 millimeters above the edge of the anterior nares close to and on each side of the septum.

each case it is necessary to determine before operation whether one or both pairs of cartilages are overgrown as the amount of tissue excised must vary with the extent of the enlargment.

Figure 2 indicates the double-edged pointed knife, curved on the flat, tunneling its way between the cartilage and the overlying skin having been introduced from within the nose 3 millimeters above the edge of the anterior nares close to and on each side of the septum. The knife penetrates the lining and cartilage and tunnels its way upward over the tip beneath the skin until it passes the uppermost limit of the overgrown area where the point again enters the nasal chamber. This may be at the dividing

the cartilage an
dorsum on both
in Figure 3. The punch forceps of Joseph or a pair of straight pointed scissors may be used for this purpose.

The width of the nose is thus reduced in direct proportion to the width of the strips removed. Care should be taken therefore that too wide a strip be not excised lest the breathing space be unduly diminished after healing and subsequent contraction.

In order to narrow the nose to the desired extent, two other incisions must be made also from within extending laterally from the upper end of each of the vertical defects to the root of the nose, thus permitting the edges of the dorsal defects to fall into apposition. Sutures are not required in these situations. In fact any attempt to use them results in a puckering of the overlying skin. Lateral compression of the lower end of the copper splint after it is placed over the nose is relied upon to hold the wound edges in contact.

To lower the tip and place it on a proper plane with the bony dorsum, incisions are made in the mobile septum, as indicated in Figure 4. With a double-edged straight-pointed knife the subseptum is transfixed just above the skin edge of the columella, and a cut extending from the tip to the anterior nasal spine is made through the entire septum. The septum is again transfixed at the junction of its cartilage with the subseptum and an incision about one third shorter and parallel with the former one is made. Now with a pair of straight pointed scissors a section of the entire septal tissue between these two incisions is excised. The length of the section thus removed should be in proportion to the extent of the desired replacement of the tip. Generally speaking it varies from 0.5 to 1 centimeter and must not exceed this amount, or later contraction is likely to overcorrect. Besides where too much tissue is removed the redundancy of skin covering the columella is not entirely overcome by shrinkage, and an unsightly puckering results after suturing. When the gap created by the removal of this section is closed by bringing the anterior and posterior edges together with one through-and-through suture of heavy black silk (indicated

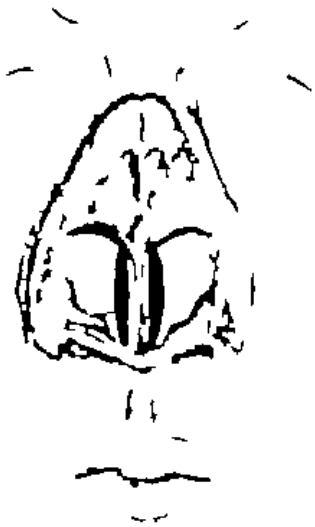


Fig 3 A strip of tissue 5 to 7 millimeters wide, including the cartilage and its lining is excised from the dorsum on both sides of the septum

by dots) the tip is drawn downward A sufficient number of superficial sutures of finer silk on each side of the septum serve to close the wounds completely

The method of dressing may be of interest The nasal fossæ, for an inch back of the vestibules are packed with half inch iodoform tape leaving a portion of both vestibules just above the nares unpacked The packing of this lower portion is now done in the following manner

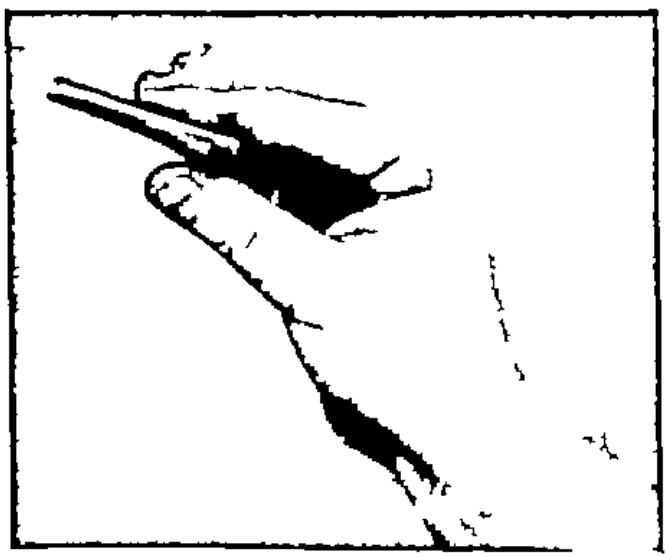


Fig 5 Modification of Killian s speculum used to introduce the graft in correcting concave dorsal deformities



Fig 4 Incisions are made in the mobile septum to lower the tip and to place it on a proper plane with the bony dorsum

a gauze strip laid flatly against the left side of septum is brought downward out of the nose around the columella and carried upward into the right vestibule along the septum, when it is folded upon itself again brought downward around the columella and into the left nares and so on until both sides are loosely filled with gauze tape which furnishes a perfect dressing over all septal wounds and the columella itself A narrow strip of adhesive over this gauze covering the columella and drawn snugly upward on both sides in the shape of a swing to be attached to the splint above, serves to hold the wound edges closely in contact, and lessens tension on sutures

In applying the copper splint in these cases the adhesive strip holding it should be placed on a slightly lower level than usual so that pressure thereby exerted on the tip of the nose will still further reduce tension on the main through and through suture

The patient is required to remain in bed 4 days and to spend as much time as possible on



Fig 6 Position of graft to take the place of the quadrilateral cartilage destroyed by septal abscess.



Fig 7 Case 1 before and after operation.



Fig 8 Case 2 before and after operation.

the back so that the nasal secretions flow backward into the throat and lessen the likelihood of wound infection The first change of packing is made on the fourth day sutures being removed on the fifth The splint should be continuously worn for 2 weeks changing it every third or fourth day for purpose of skin toilet. In a number of cases thus cared for, primary healing and satisfactory results have been obtained without exception.

Illustrating results photographs of several patients before and after operation are here shown

Case 1 Male age 20 Had a large bulbous tip projecting high above the plane of the rest of the nose. In the after-picture which we were obliged to take a couple of weeks after operation, because patient was forced to

natural form

This was done in the manner above described The after picture in this case was also necessarily taken before the swelling had entirely disappeared.

Perhaps of far more general interest, because the results appear more striking but by no means so difficult of execution, are the operations for correcting concave dorsal deformities (so-called saddle nose) either congenital or acquired by the use of bone or cartilage grafts. Grafts of septal and of costal cartilage have been used by different operators. Bone from the lower turbinate the tibia, and that of the rib has been variously employed All of these have been tried by the essayist, except the septal cartilage, which in my opinion has no place in this work, as absorption is certain to follow besides it is seldom thick enough for the purpose.

Gillies idea of using costal cartilage alone in all cases has not proven wise in the experience of the essayist Such grafts never form union with bone and are, therefore never firmly fixed on the nose they are always absorbed to a greater or less degree

Likewise, bone grafts from the anterior edge of the tibia have proven a failure in several of our cases. The biological difference between the nasal bones which in their construction, nerve and blood supply closely resemble the rib and the tibia with its large narrow canal and haversian system would seem sufficient reason why the tibia graft does not unite with bones of the nose and become a fixed part of its bony framework Then too after 4 or 5 years, so much of the tibia graft is lost through absorption that the results have been a disappointment to both patient and operator

The irregularity of the lower turbinate, its thinness, and the fact that it is removed from a bacterially laden cavity seem sufficient reasons for discarding it entirely in these operations.

The ideal substance in this work as shown by results of the essayist and also of Carter, has

all of my cases is firmly united to the nasal bones within 6 weeks. The costal cartilage removed with and left attached to the rib bone lies over the cartilaginous nose, and permits a certain amount of mobility in that portion not to be



Fig 9. Case 3 before and after operation



Fig 10. Case 4 before and after operation

obtained by bone alone Besides a graft thus constituted can be made so long that the lower end presses slightly on the tissues of the tip of the nose, without any danger of subsequent sloughing of the skin from the pressure of the cartilaginous end of the graft. In this manner therefore, by means of a dorsal graft the nose can be made a trifle longer when necessary

Danger of perforating the pleura, with a resultant empyema, has been offered as an objection to the use of the rib Also the difficulty of properly shaping the bone as compared with the costal cartilage has been urged as another reason for the use of the latter alone While perforation of the pleura is a very undesirable occurrence and happened twice in my early work without infection however it cannot be held as a reason for not making use of the rib graft With improvement in technique as the operation is now performed perforation of the pleura need never occur Moreover if one's asepsis is beyond criticism, infection does not follow such perforation

When *but a shallow depression of the dorsum* exists, it is unnecessary to take a section of the entire rib A strip of the outer table, through the diploic structure down to the inner table, removed with sharp chisels, furnishes all the thickness required In marked cases of saddle nose, where the entire rib thickness is needed to fill the defect the periosteum of the outer table is twice incised along the axis of the rib The distance between these two incisions, generally from three-sixteenths to one-quarter inch, indicates the width of the graft to be used. These incisions are extended as far into the costal cartilage as desired and of course, their entire length must vary according to the estimated length of the graft required In this way the periosteum of the outer table is left attached to the graft With a periosteal elevator the remaining portion of the periosteum of the outer surface in the region of the graft is separated well over the upper and lower edges of the rib It is now but a moment's work with the elevator to separate the periosteum from the entire inner surface so that the rib shears passing between bone and periosteum never come in contact with the pleura

It is my practice never to permit the graft to be touched by the fingers either gloved or otherwise nor is it permitted to come in contact with the edges of the wound while being introduced into the nose. By this, I am certain infections are avoided. No difficulty has been experienced in trimming the graft any shape desired with bone shears and heavy scalpel when it is placed on a table covered with sterile towels and firmly held with bone forceps or in sterile gauze To introduce the graft finally it is placed in a long speculum a modification of Killian's for rhinoscopia media (Fig 5) The speculum containing graft is introduced through the incision in the *left vestibule and passed upward all the way to* the frontal notch. Pressure on the graft is now released with set-screw of the speculum and graft pushed home with a pair of forceps as the speculum is withdrawn

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been indispensable It must be borne in mind as stated in previous papers, that undermining of the skin of the nose and preparation of the bed for graft is done through this incision in the wing preferably through the left vestibule.

Another observation of importance is that since contraction follows in the wake of every

incision made through the wing cartilages, it has been found best for the ultimate cosmetic effect to make similar incisions in both wing cartilages though incisions on one side would suffice for the actual operation so that contraction when it occurs will be equal on both sides, and not disturb the symmetry of the nose

Much has been said about the relative value of the large and small incision through which the graft is introduced, and also of the dangers of infection where large incisions are made My preference always is an incision of sufficient length to permit absolute freedom of action, always feeling assured that, with perfect technique infection of graft is unlikely to result

The graft is held in the mid-line of the nose by means of the copper splint which when properly strapped with adhesive also holds the graft in such intimate contact with the nasal bones that bony union has not yet failed to occur in any of my cases

In saddle noses following septal abscesses where the loss of the entire quadrilateral cartilage has taken place it is necessary that some sort of support be furnished in its stead, to prevent a tipping downward of the lower end of the graft. This support is supplied by the introduction of a thin section of costal cartilage, of desired shape which rests on the anterior nasal spine below and against the dorsal graft at the tip above (Fig 6) It has been my custom to prepare a bed for this graft, under local anæsthesia, before ether is given to remove the rib and prepare bed for the dorsal graft. In this manner one avoids the obstacle offered by hæmorrhage, which at times is so profuse under ether as to obscure the field of operation and to render likely a buttonholing of the septal flaps. Should buttonholing of the flaps occur infection of graft is almost certain to follow



Fig 11 Case 5 before and after operation

Case 4 Female age 30 Congenital saddle nose The bridge in the region of the notch was so flat that it was impossible for her to wear eyeglasses. A section of the entire rib was used in this case. Operation was performed 14 months ago After-picture taken 3 weeks ago Graft in excellent state of preservation.

Case 5 Female age 19 Acquired saddle nose following septal abscess 3 years before The entire septal cartilage was destroyed, and the resulting contraction caused an enormous depression A dorsal graft of the entire thickness of the rib with cartilage at its lower end as well as a septal graft of costal cartilage was necessary in this case.

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BONE SURGERY OF THE NOSE[1]

By WILLIAM WESLEY CARTER, A.M., M.D., F.A.C.S. New York

NASAL deformities of whatever description are due to or are accompanied by abnormalities or irregularities in the shape size, or position of the bony and cartilaginous framework of the organ. The function may be disturbed or the skin of the nose may be involved in various ways but these are accompaniments to the much more important basic fault which lies in the framework. Upon our ability to reconstruct this or to adjust its component parts so that it will support the soft tissues and preserve the contour of a normal nose depends the success or failure of our efforts to effect a permanent correction. I say permanent advisedly because we all know that sometimes a misshapen nose may be forcibly mobilized and molded into perfect shape by means of splints, but if the correction does not involve the proper adjustment of the framework the original deformity recurs with incredible celerity after these supports are removed.

My work has been confined to the human subject and therefore, I have been unable to observe to any extent the microscopical changes occurring in bone and cartilage after transplantation but I have kept some of my patients under observation for many years, for I began this work nearly 15 years ago and by making frequent physical and X ray examinations, I have found out what final clinical results may be expected and I know from a practical point of view what happens to bone and cartilage when it is transplanted into the nose.

phase of the subject so I will confine my remarks chiefly to bone transplantation and those basic principles which as I have stated furnish the keynote to all plastic surgery of the nose.

From a practical mechanical, and architectural point of view the nose is an arch composed of an indefinite number of bone and cartilage segments so placed that it will retain its shape and position when supported only at its extremities. The upper edge of the septum where it is wedged in between the lateral cartilages, constitutes the keystone of the arch. The displacement or destruction of this or any of the other segments causes more or less collapse of the structure resulting in a flattening of the curve and the re-establishment of the arch on a lower level. The septum as a vertical support strengthens the arch but is not necessary for the preservation of its integrity.

In recent fractures and in old traumatic deformities where there has been no loss of bone or cartilage I am still using the bridge splint which I devised a number of years ago and with which you are all familiar. This instrument holds the segments of the arch in proper position until union has occurred.

The most frequent use for bone and cartilage transplants in rhinological surgery is found in those cases where a deficiency in the frame work has resulted in a depressed deformity which may involve the tip as well as the dorsum of the nose. The most frequent causes of this deformity are (1) congenital defects (2) traumatism (3) the submucous operation due either to faulty technique or infection following the operation (4) abscess of the septum (5) atrophic rhinitis (6) syphilis, tuberculosis, lupus etc.

We must remember that the function of the transplant is not primarily that of a mechanical filler to replace tissues that have been destroyed this is a secondary though often an important consideration from a cosmetic point of view. Our chief concern is to restore the function and symmetry of the nose to their normal state by this if possible without leaving an obvious scar. In order that this correction primarily secured may be permanent and able to withstand the powerful influence of cicatricial contraction and elasticity of the skin which must always be reckoned with the foundations for the new framework must be carefully selected and the transplants accurately placed upon them. The bone graft must be alive and capable of growth and must establish bony union with the adjacent bones in its new position. The best results are point of contact with the transplant. Bare bone is useful for its mechanical and osteoconductive properties and even if it is later absorbed. It is replaced by bone or connective tissue and the results are more or less satisfactory. It does not

[1] Read before Clinical Congress of American College of Surgeons, Philadelphia, October 1921.



Fig. 1 Congenital specific deformity at left, before operation At right, deformity corrected by bone transplant (strut operation) Photograph taken 1 year after operation.

however, possess the inherent vitality of the periosteum-covered transplant.

It is not my purpose to discuss here the various views held by different writers in regard to the growth of bone and the influence of the periosteum in the regeneration of bone My clinical cases appear to show that bone is formed by the so-called perioseous osteogenetic layer of the peri osteum and that the cells of this layer are pro-

tures

The vigor of the transplant is greatly aug mented by placing it in contact with live periosteum-covered bone. In none of my cases has there been an overgrowth of bone, the normal growth of the tissues here as elsewhere in the body, being regulated by the functional demands and by the hereditary limits of growth for this locality On the other hand if the transplanted tissue lies passive and performs no function it is soon absorbed even though it had been received kindly by its host and had originally established vascular connections. This is in accordance with the physiological law that functionless tissues meet with no tolerance in the human economy

For transplantation into the nose I still use a section of the eighth or ninth rib and costal cartilage, removed at the time from the patient s right side. I have previously described my operation but I feel that I am justified in briefly reviewing this for the sake of favoring the inter pretation of my illustrations and to call attention to some modifications and improvements I have made in the technique The patient is etherized and turned on the left side with a sand bag support under the lower chest wall After the initial painting of the operative field with iodine only freshly sterilized physiological salt solution is used All antiseptics such as bichloride alcohol etc. are carefully avoided, as they are protoplasmic poisons and would cause the death of the transplant A section of the rib 2 inches long is removed the periosteum on the outer surface being preserved If it is a case in which it is considered necessary for the transplant to extend into the tip I remove the section at the costo-chondral junction and have the graft consist of two-thirds bone and one third cartilage This preserves the resiliency of the tip In some instances I remove only the outer half of the rib but where I expect to need more than one piece I do not hesitate to remove the entire section There is no loss to the chest wall for the deficiency is filled in with bone in some instances 2 months after the operation The section of rib is split and the cancellous tissue scraped off with a curette I prefer thin transplants and sometimes introduce several in preference to one thick piece as the viability of the transplant varies in inverse proportion to its bulk.

The nose is then prepared for the reception of the graft. A small incision through which all of the work is done is made in the roof of the left nasal vestibule (I have long since abandoned my original external operation.) The periosteum over the nasal bones and the nasal process of the frontal is elevated and an incision made into the latter for the reception of the upper end of the graft The subcutaneous elevation of the tissues extends over the nose and in some instances for a considerable distance under the cheeks The transplant is then carefully placed in



Fig (at left) Shows arrangement of transplants in accurate contact

position No effort whatever is made to expel the blood clots for this pabulum temporarily nourishes the transplant and the fibrin of the clot greatly favors osteogenesis. The entire bone is immobilized by means of a well padded tin lined copper splint In those cases where the traumatism has necessarily been great and the hemorrhage considerable, I use my hot water jacket for the first 24 hours Thus limits the swelling aids in the establishment of the capillary circulation and diminishes the subsequent ecchymosis

Under favorable conditions in a healthy young

fulcrum for the transplant I introduce between the columnar cartilages a strut composed of

extremely satisfactory and use it in many of my cases. It insures the elevation of the lower end of the transplant and enables it to withstand the drag of cicatricial tissue and the elasticity of the skin

Our object is to secure permanent results, and these are dependent upon the histological or

siderable difference of opinion and I do not believe that the question will ever be settled definitely from the pathologist s point of view for not only do results vary with varying technique but it has even been found that among operators employing the same technique, the difference in personal equation produces diametrically opposite results In my opinion the difference in results is caused (1) by the inclusion with the transplant of more or less of the periosseous osteogenetic layer of the periosteum

metabolism of the host

In syphilitic subjects during the active stages of the disease and while they are Wassermann positive bone transplantation is not to be considered. I have secured good results in selected cases where the patient was apparently well of his disease and was in excellent physical condition Here in addition to the unusual severity of the deformity and the large amount of cicatricial tissue which is always present in these cases, we are contending with perverted metabolism and a bone transplant is exceedingly sensitive to this In specific cases one should always be guarded in his prognosis even under the most favorable conditions.

If the wound becomes infected a part or all of the transplant will die If the infection is controlled without having to remove the graft the dead portion will be absorbed The periosteum is far more resistant to infection than bone I have known the periosteum to establish vascular connections with the surrounding tissues and remain *in situ* after the removal of the dead graft

Strict asepsis is essential in this work for no progress was made in the transplantation of bone until after the introduction of aseptic surgery No matter how slight the infection may be a

the nasal secretion are factors in our favor still we must not place too much reliance upon them but must make every effort to secure a clean *field*

I have had fewer infections since I adopted the intranasal route for the introduction of the transplant.

I have used cartilage to a considerable extent in the correction of minor deformities and irregularities and as a support where cartilage is normally present in the nose I have secured excellent results in cases of collapsed alæ by grafting thin strips of cartilage into the wings. The use of gold wire splints as recently advised by me, after intranasal plastic operations, has added greatly to the efficiency of this operation Cartilage is viable and is permanent and is more easily shaped to fit the deformity, but it never establishes osseous connection with the frontal bone but remains always movable

In conclusion I will say that in my opinion based upon my own operative and clinical experience, the live periosteum-covered autogenous bone transplant combined with cartilage when indicated is the ideal tissue for use in the correction of this difficult class of nasal deformities

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SECONDARY PERINEAL REPAIR

Description of a Simple Technique

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Of recent years there have appeared many descriptions of operative procedures for the secondary repair of perineal lacerations it would therefore seem superfluous to add another technique to an already overstocked literature especially as there is no great originality expressed, only as the writer believes an improvement upon the usual operations The only extenuation that is made for this contribution is the simplicity of the performance and the correction along anatomical and pathological lines of a condition that is all too common

In order to justify an operative procedure of this nature a brief description will be made of first the anatomy of the pelvic diaphragm second the mechanics of the birth injury, third the mechanics of repair by operation

ANATOMY

The pelvic, or lower abdominal diaphragm consists of a sheet of muscular tissue enclosed in a fibrous sheath stretching across the bony outlet of the pelvic canal. The outlet of the pelvis consists of two triangular areas the bases of which have a common line drawn from one tuberosity of the ischium to its fellow on the opposite side The anterior segment has its apex at the pubic symphysis and its sides are the descending rami of the pubis. The posterior segment has its apex at the coccyx and its lateral boundaries are the ascending rami of the ischium These two triangles are on two different planes. With the patient in the dorsal position the anterior one runs at right angles to the horizontal plane, the posterior one at an angle of 45 degrees. These facts are more of obstetrical value in the mechanism of delivery in outlet contractions yet they have an anatomical bearing upon the causation of some of the perineal lacerations.

The muscles that bridge across this opening making the pelvic diaphragm are the levatores ani and the coccygeus. The levatores ani muscles are two fan like structures having their origin from the posterior surface and lower border of the symphysis pubis and extending backward on a line from this point to the spine of the ischium This latter line of origin is the so-called white line, which is thickened fascia—being the line of division of the obturator fascia into rectovesical and anal The muscular fibers from the posterior and mid point converge in a fan like manner to be inserted into the rectum The anterior fibers arising from the posterior surface of the symphysis pubis form a sling that descends behind the descending rami encircles the introitus and vagina, and are inserted into the rectum and coccyx It is this latter bundle of muscles that has been named the puborectalis or coccygeus and which is subject to injury during delivery

The fascial sheath of the levatores ani muscles consists of the rectovesical fascia upon its upper surface and the levator or anal fascia on its under surface As pointed out by Haynes (1) this sheath has the important function of reinforcing the muscles and binding the muscle fasciculi together in a compact manner and aids

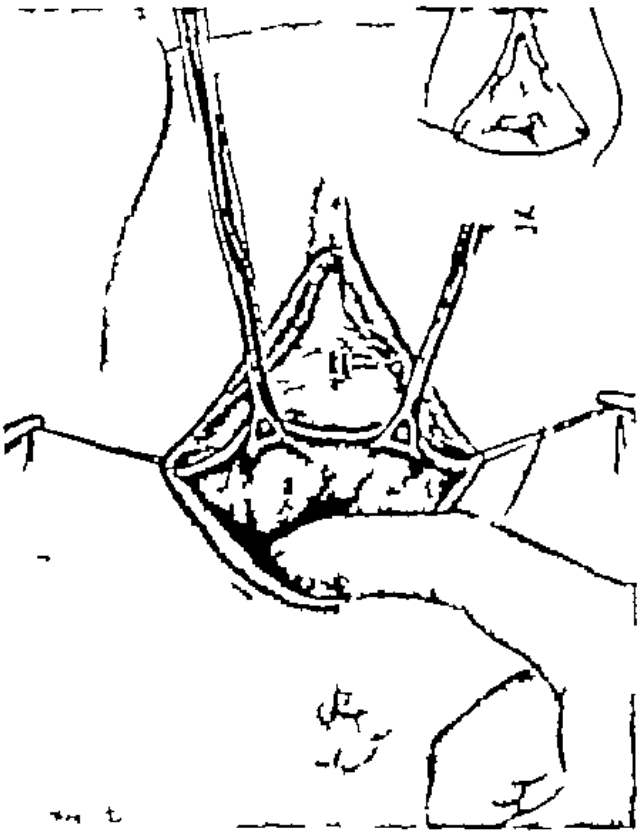


Fig 1 a, Steps 1 and 2 b, Step 3 The index finger of operato hand is shown making traction upon anterior rectal wall, thereby bringing the right puborectalis muscle into view

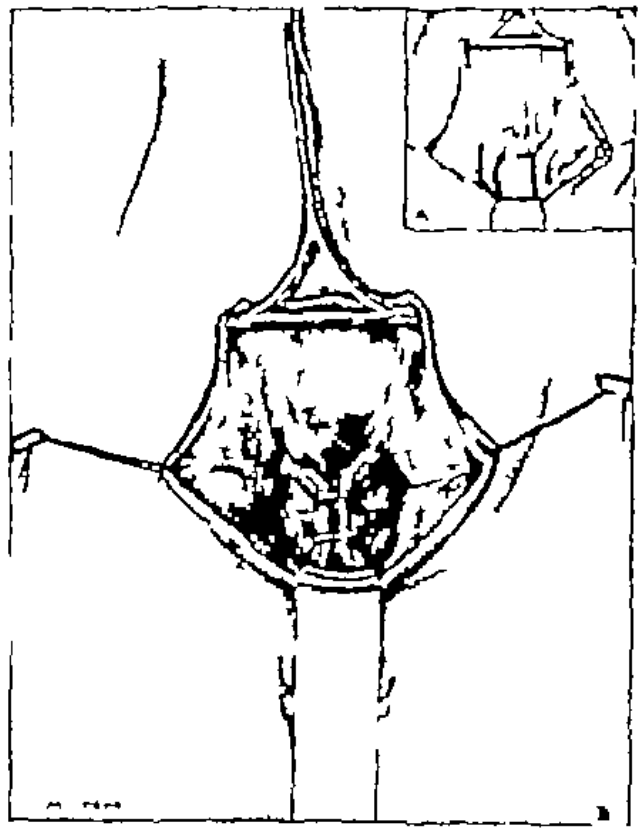


Fig 2 a, Shows placing of suture through right puborectalis muscle and sheath b Shows the two chromic gut interrupted sutures in both muscles. This procedure ends Step 4

it materially in performing its function of maintaining the support of the pelvic and abdominal organs. According to Frank (2) these fascia blend at the anterior border of the puborectalis portion of the levator ani.

The coccygeus muscles are two small triangular muscles that fill in the gap posteriorly between the spine of the ischium the sacrosciatic notch and ligament and the coccyx

The next structure of importance in the anatomy of the perineum is the trigone or triangular ligament This is a fibrous membrane attached to the bony boundaries of the anterior segment of the pelvic outlet It is triangular in outline. Its base stretches across from each tuberosity of the ischium in front of the anus, its apex is attached to the pubic arch and subpubic ligament and its sides to the descending rami of the pubis in front of the puborectalis muscle and sheath with which it is in intimate contact This membrane consists of two layers between which runs the deep perineal muscle. There are two

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It can readily be seen that the trigone plays an important function in the support of the urethra and vagina and gives secondary aid to the levatores ani muscles in maintaining its usefulness as a lower abdominal diaphragm and perineal support of the anterior segment of the pelvic outlet

THE MECHANISM OF BIRTH PERINEAL INJURIES

In a normal delivery following complete dilatation of the cervix and rupture of the membranes the presenting part of the fœtal ovoid is propelled downward by expulsive voluntary abdominal contractions and uterine contractions to the pelvic diaphragm. That part of the fœtus which comes first in contact with this structure is rotated anteriorly directly under the public arch and this acts as a fixed point or fulcrum By a continuation of the expulsive forces, the posterior portion of the presenting part is propelled in an upward and outward direction distending the

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the beginning of the perineal stage. As labor

progresses the presenting part appears at the vulva outlet and the structures of the anterior segment of the pelvic outlet (puborectalis muscles trigone and other perineal muscles) are gradually more distended at each expulsive effort until the presenting part is born

In a normal delivery where there is no disproportion between the fœtus and pelvic outlet and in a patient possessing elasticity of the puborectalis muscles and triangular ligament, delivery can be accomplished without damage to these structures. Superficial lacerations, nevertheless, may occur that do not interfere with the integrity of perineal support.

However instances exist many times in which there is disproportion between the fœtus and pelvic outlet in varying degrees In order to overcome this obstacle, and for delivery to take place spontaneously it is necessary for the expulsive pains to be of greater force and over a longer period of time. Under such circumstances inertia frequently occurs and the accoucheur resorts to forceps to accomplish delivery The posterior segment of the outlet as pointed out by Klein (3) and later by Williams (4) is markedly encroached upon and great distention of the perineal structures occurs in order to accomplish the desired end Deep lacerations usually take place, at times in the median line through the trigonum down to and occasionally through the sphincter ani producing a complete laceration. More often there are lacerations laterally in the vaginal sulci which may or may not involve the puborectalis muscles

In elderly primipara and among the athletic types of women the perineal structures may be unresisting and non-elastic Lacerations of the perineum frequently occur with this class. Median or lateral perineotomy however may prevent a severe or awkward laceration

During the course of any delivery an emergency may arise that makes it imperative to terminate labor by forceps or version before the presenting part has reached the perineum and without the preliminary softening and thinning out of the pelvic floor Under such circumstances deep lacerations are common—involving the puborectalis muscles and triangular ligament and often through the sphincter ani.

When the puborectalis is lacerated through the site of the tear is usually along its insertion into the rectum. Instances are related where the muscle has been torn from its point of origin behind the symphysis pubis. I have never seen such a condition and the recognition of such an accident would be very difficult to determine.

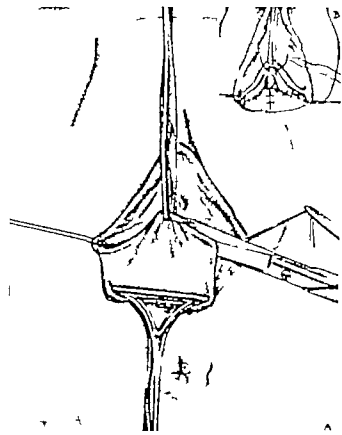


Fig 3 a, Shows method of excising excess of vaginal mucosa b Shows beginning of submucous suture

When perineal lacerations occur the primary suture of the injured structures if done anatomically and under proper conditions will in the majority of instances prove successful in its repair Unfortunately the proper environment and aid are frequently lacking when attempting this operation Therefore failures occur often

union as a rule of the vaginal mucous membrane and, if the perineal skin has been sutured union has taken place there. The edges of the puborectalis however, have retracted laterally from its rectal insertion allowing the rectum to protrude through the posterior vaginal wall. Improper union of the triangular ligament in a similar manner causes a relaxation of the structures that depend upon it for support, then follows an eversion of the vagina, and relaxation of the vaginal outlet and a general lowering of tone of the whole perineal body

Another class of cases includes the women who have had numerous deliveries in a short space of time one child follows the other before complete perineal involution has occurred When such a condition exists the puborectalis muscles and the

A NEW SPLINT FOR FRACTURES OF THE FOREARM[1]

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FRACTURES of both bones of the forearm are the most poorly treated of all fractures in the body. The methods of splinting now used have been in vogue for many years and while known to be inadequate have never been improved upon. The late war taught us an efficient and easy method of splinting fractures of the lower extremity and as a result we have discarded to a large degree the older methods. The Liston splint, Buck's extension and many of the cumbersome and unwieldy forms of apparatus advocated by the German surgeons have been supplanted by the more modern splints of wire and steel rods and for weight and adhesive traction we now use direct bone traction by means of the tongs and the Steinmann pins. The war has also taught us that it is not necessary to bind up a fracture in boards with an artistically arranged bandage and has dispelled the old misplaced complacency we formerly felt in a fine appearing external dressing. For fractures of the upper extremity and especially those of the forearm we have no adequate and efficient traction splint. For forearm fractures the anterior and posterior straight board splint is our only generally recognized dressing.

Fracture of both bones of the forearm is a rather common injury, occurring as it does in about 8 per cent of all fractures. Brun reports out of a total of 8,560 fractures, 752 of the forearm or about 8.7 per cent. Chudowsky of a total of 2,366 reports 125 fractures of the forearm or 5.32 per cent. Immelman in 2,048 fractures reports 7.5 per cent of the forearm, and Plagman reports 9.62 per cent. This fracture therefore is common enough to merit more attention in treatment than it now receives. It occurs in the young most frequently, the deformity is usually a lateral or backward angulation, the dorsal surface of the forearm forming an obtuse angle and the ventral surface forming the salient angle.

Reduction under general anesthesia, even when checked up by the fluoroscope, is most difficult. The muscular masses are out of proportion to the size of the underlying bones, the muscular pull is in many diverse planes, the bones are small and the ends are usually pointed or oblique. The radius is especially difficult to engage; it is usually fractured in an oblique manner and even though it is reduced to keep it in position with wooden splints and without traction is next to impossible. There is no fracture where the ultimate resort to operation is so frequent or where the results are so poor. As the bones are so near to the skin surface infection is very frequent, plates loosen, and deformity occurs.

The splint I have devised for this fracture is a metal tube splint. It is an ambulatory dressing. It is light in weight and is inconspicuous. The posterior two-thirds is made of light tube steel with two lateral arms and a posterior cross piece. The anterior one third is made of a steel rod, the anterior end of which is expanded into a large ring. The rod fits into the tube portion of the splint like a sliding trombone and can be extended by two screws or turn buckles traveling on the threaded anterior portion. A removable aluminum shield is clamped to the tubing and is set at such an angle that it impinges on the anterior surface of the upper arm with equal pressure at all points. The hand is tied to the expanded circular anterior portion of the splint by means of cords fastened to the fingers of a glove buckled about the wrist. The shield well padded is applied to the anterior surface of the upper arm, which has been flexed to a right angle and held with adhesive plaster. The turn-buckles are then tightened, and traction and counter traction are maintained with the arm in full supination.

If it is desirable to dress the arm in the mid position midway between supination and pronation, a small rod is dropped into a ring on the anterior part of the splint at right angles to the horizontal plane of the splint and the cords are

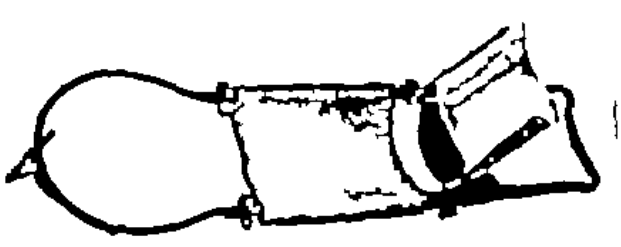


Fig. Photograph of splint.

[1] Demonstrated to American College of Surgeons, Philadelphia, October 3, 1921.

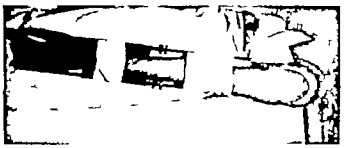


Fig 2 Splint applied to arm

For this class of cases, the shield is removed and the expanded anterior section of the splint is fitted over the shoulder and a heavy pad placed over the acromion process. The glove-encased hand is attached to the posterior cross bar and the splint is extended by the turn buckles. The arm may be maintained in this position under constant traction until reduction is obtained and then the more comfortable position of flexion may be used. As the point of fixation, when the splint is applied in this way, is a bony one there is no danger of pressure on either nerves or blood vessels as occurs in splints with a crutch attachment and where the point of pressure falls in the axilla. The splint is held in place by swathes which are placed about the chest and neck

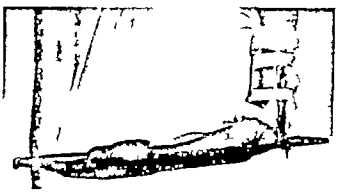


Fig 3 Arm flexed

The advantages of the splint are that—

1 It is light and comfortable

2 It leaves the part open for massage and inspection without disturbing the constant traction.

3 Constant graded traction is maintained at all times and can be increased or decreased by the patient if too uncomfortable.

4 The progress of the traction can be watched by the X ray

5 It can be used for more than one type of fracture.

6 All points of pressure are free from nerves and blood vessels

7 It is inexpensive and durable.

THE DIRECT STIMULATION OF PERIPHERAL NERVES

Rules for Technique in the Operating-Room

By HENRY O. THIS, M.D., Cleveland, Ohio

In a previous work in collaboration with two others[1] a brief report was made of peripheral nerve injuries sustained during the war. In that report mention was made of the fact that during the operations on these cases they were almost always tested for faradic excitability. No detailed account of the method was given at that time, but owing to the fact that much interest has recently been manifested in operations applying to peripheral nerves, as carried out by Stoffel, the writer submits the following account of the method used by him on hundreds of wounded men observed in a neurological capacity at the Ambulance before and after it was taken over by the U. S. army. His experience in this work is derived from the operating room also, but is also based upon certain experimental data obtained previous to the war.

In stimulating nerves in the operating room one soon learns to establish a definite routine which resolves itself into a set of rules. No doubt there are certain deficiencies in those used by the writer, but they are presented for what they might happen to be worth and as they were actually carried out.

Rule 1. After exposure of the nerve [illegible] *distance* [illegible] *the cord is found locally in and about the nerve, but care should be taken not to strip the nerve clean for any greater distance than is absolutely necessary, as such a procedure [illegible]*

[illegible] *owing to the much altered* [illegible]

[illegible] *is of the greatest importance especially when they are positive. Their importance lies, first of all, in the fact that one need not consider anything analogous to the escape of current which complicates the use of electrical stimulation, as the stimulus is conveyed only by the nerve fibrils. In the second place, these responses obtained by mechanical stimulation give us a very clear notion from the point of view of conductivity of the precise functional state of the nerve as well as of the muscles which it supplies, because of the extreme delicacy of the test.*

Rule 2. Before faradic stimulation, the nerve previously freed should be lifted up on a non-conductor, such a glass hook being very useful. The object of this is to isolate it from all other tissues. If, however, the nerve is found divided, the only safe technique is to take a suture through the end of the segment to be stimulated and to lift it up in that way.

Rule 3. During the act of stimulation the nerve should be kept moistened with warm salt solution. This is easily done by having the assistant moisten a sponge with the solution in a bath of fluid, thus promoting spread of current.

Rule 4. For faradic stimulation the bipolar electrodes are usually considered more practical than the unipolar ones (whereas in stimulating cortical areas unipolar electrodes are better). The electrodes should be of metal all the way through so as to be easily sterilizable. The points themselves had better be of platinum and should be constructed so that the distance between them may be altered with ease. It was found expedient to have the two platinum wires entirely free for a distance of about 3 centimeters so that the distance between their free ends could be adjusted by simply bending the wires.

Rule 5. It is perhaps best to start with a current of only moderate strength. A strong current is dangerous on account of spread and should be used only on occasion where a weak or a moderate current has been previously tried. A good procedure is to test the current before the operation by applying the electrode points to the tip of one's tongue; a current which just begins to be

[1] Major G. E. Pfeiffer, H. O. This, and Lieutenant Terhune, Peripheral nerve injuries, Arch. Neurol. & Psych., 1919, i, 517-579.

[2] H. O. This, On the function of nerves, Quart. J. Exper. Physiol., 1919, xi, [illegible]

perceptible, being a good current to start with on the nerve. This having been done, the relationship of the secondary coil to the primary coil is noted and maintained for the beginning of the operation. For thick nerves such as the sciatic or where there is much scar a stronger current will be required, in order to insure that the inner central fibers are engaged in carrying it

Rule 7 Stimulate the nerve on all its sides and if there is a neuroma, stimulate above and below the neuroma, as well as in the course of the neuroma itself Remember however that the interesting portion of the nerve for efferent fibers is the segment peripheral to the lesion For afferent fibers, the central segment is more important and one looks for responses in the pulse, respiration, pupils skeletal muscles, etc.

Rule 8 If the response for efferent impulses is positive, the surgeon should attempt to separate the nerve into its constituent bundles and to test each bundle, one at a time. In this way he may be able to obtain precise information as to which part of the nerve has escaped injury or has regenerated The surgeon should also examine the neuroma with the same object in view namely, to see if there are any tracts which are excitable or conduct impulses.

Rule 9 It is important to note the precise nature of the responses, it is not enough to say whether the response is positive, but it is also necessary to describe accurately what the response is. For example In stimulating the musculospiral nerve above the elbow note whether the wrist extends and whether there is an extension of the fingers and thumb More than that, note how great and how powerful the movement is In stimulating the median nerve just above the wrist this rule is of the greatest importance because the normal responses here are only of the thumb and two fingers and are not great in their extent, whereas, more central stimulation evokes responses which are more extensive and powerful. In some cases the muscles and their tendons contract, but bring about no movement of the joints to which they apply this is owing to mechanical resistances as occasioned by contractions or ankyloses.

In stimulating the sciatic nerve, the interpretation may be difficult. If plantar flexion takes place in the ankle it must be the effect of stimulating fibers in the internal popliteal nerve. But we cannot infer from that, that the external popliteal nerve is out of commission because frequently the muscles supplied by the internal popliteal nerve have greater power than those supplied by the other In order to determine the true condition of excitability in these two branches, one must either first separate them completely or stimulate each separately, well below the bifurcation

Rule 10 The writer has usually started with slow interruptions in the current, not only because the effect of excitation may be better studied but also so as to avoid fatigue This rule is however subject to modification and as it is known from experiments on the vagus nerve that some of its fibers respond better to certain given rates of interruption it is perhaps better in some instances to try different rates of interruption

Rule 11 If it is decided to exsect the neuroma which is often found connecting the two segments of the lesion it is of interest to study the extremity during the actual exsection because this act is nothing more or less than a form of mechanical stimulation Therefore, when this is to be done one should be prepared to observe the effect the neuroma should first be cut off from the central segment and secondly from the peripheral segment. This may reveal a peculiar condition of conductivity in the neuroma. Occasionally it is found that on stimulating the peripheral segment responses are obtained which were not obtained on stimulating the central segment According to most physiological opinion, this means that fibers have grown down from above (in the central segment) and have indirectly connected with the peripheral segment through the scar tissue around the lesion

It goes without saying that observations as made in the operating room are valuable only if a careful examination of the part has been made beforehand and the last examination should have been made only a few days before the operation If this is done the data derived from direct stimulation of the nerve are adaptable to comparison with the data obtained previously by stimulation through the skin and should of course confirm these findings Should there be any discrepancy, the data obtained by direct stimulation are to be considered the more accurate But if the two sets of data correspond then the whole set of findings becomes immensely more valuable.

INDUCTION OF LABOR BY THE USE OF CASTOR OIL AND QUININE

A Report of Three Hundred Cases[1]

By A. C. WILLIAMSON, M.D., Pittsburgh
Assistant in Obstetrics, Western Pennsylvania Hospital

THE attempted induction of labor by the use of castor oil and quinine is one of the commonest procedures in obstetrics. It is harmless, so that if it fails there is nothing amiss; if successful, labor has been inaugurated easily without undue distress to the patient or relatives and a more troublesome method of induction has perhaps been avoided. Occasionally it seems that abortions are brought about by the use of these same drugs. As early as 1890 Atkinson (1) in a court case, wherein it was contended that quinine had been the responsible agent for the abortion, asserted that there was some evidence for the assumption that quinine has an oxytocic effect, but that cinchona alkaloids had no fixed and definite action on uterine contractions except in certain cases which appeared to have an idiosyncrasy toward the compounds.

Two cases have come under observation in which I feel that quinine and castor oil were responsible for the abortions. One case was that of a primipara, 3 months pregnant. She took 60 grains of quinine sulphate over a period of 6 hours. She had marked signs of cinchonism and aborted with extreme pain, but at the end of the third day seemed to have recovered from all ill effects of the experience. The second patient was a multipara, 4 months pregnant. She took an ounce and a half of castor oil and forty grains of quinine. Her pains were sharp and she had profuse vaginal bleeding, suggesting an early separation of the placenta before the os was sufficiently dilated to allow the passage of the fœtus.

Method of Employing the Drugs

The patients are allowed a light dinner and in the case of primiparæ, the oil is given at midnight, in multiparæ at 6 or 7 o'clock in the morning. These hours are purposely chosen, for administration at such times usually means that the cases will be delivered during the daylight or seasonable hours. The oil, an ounce and a half, is given with orange juice or some other vehicle of a similar nature, to enable the patient to take it easily. A hot enema, 110° F., is administered as soon as the oil is effective. Directly after the enema, quinine sulphate is started in 5-grain doses, at 30-minute intervals and continued until 20 grains have been ingested. If the patient at any time complains of ringing ears or nausea, the drug is immediately stopped. Usually if the quinine is given with a grain of pepsin there is no nausea. In a few of the cases reported, the quinine was given in 10-grain doses beginning with the effectiveness of the oil and then 2 hours later. I do not believe that the results justify the use of the drug either intravenously or intramuscularly. If the attempt failed a second trial was never made until 10 days later. The age of the patient played no part in the question of the attempted induction.

	Age	Successful	Unsuccessful
Primipara	18–39	60	80
Multipara	21–43	80	80
Total		140	160

In the unsuccessful cases, all were due by date except 20 primiparæ and the heads were fixed in all cases but 8. The induction was attempted early either because of a moderately contracted pelvis or an impending toxæmia. Of the multiparæ all the cases were due by date with the exception of 28. The heads were not fixed in 30 cases, but the induction was employed for an impending toxæmia or because the case seemed well over due, even though the dates did not correspond.

Discussion of Cases

It will be noted at once that the percentage of successful induction is 46.6 per cent. This result corresponds closely with that of Muschaluk (2) who reports 58.6 per cent in 155 cases using the drugs by mouth and 52.2 per cent in 50 cases where the quinine was used intravenously and intramuscularly. It will also be noted that the positions and presentations apparently play an unimportant and negligible part so far as success is concerned.

There were 20 cases of fulminating labor, 4 primiparæ and 16 multiparæ. These cases, together with the number ending in operative deliveries, emphasize the fact that castor oil and quinine induction is not without its dangers. All patients were carefully observed in labor and the fœtal heart counted at regular intervals. We immediately interfered at the first appearance of

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fœtal or maternal distress. By fœtal distress we mean any change in the character of the fœtal heart, any sudden continued rise or fall in the count per minute, or any discharge of meconium per vaginam in presentations other than breeches. The term maternal distress is too evident to demand elaboration

Among the unsuccessful cases, one, a primipara 20 years old with the cervix partially taken up and the head fixed, deserves special mention. After the ingestion of 15 grains of quinine sulphate, she had marked aural and visual disturbance. Her uterus contracted at intervals, the pain being severe enough to distress and keep her from resting. The uterus did not relax well between pains and fœtal distress was apparant. The contractions lasted over a period of 4 hours, and the noteworthy facts were that as soon as the contractions ceased the fœtal heart promptly became normal again and the cervix showed no change from that at the beginning.

This last fact is of interest because it bears directly on the question as to whether quinine in its action on the uterus ever has any effect on a closed cervix.

In the successful cases the noteworthy facts were (1) the patient was due or past due by dates (2) the head was fixed or was beginning to engage (3) the cervix was partially or completely obliterated and the inner os would admit a finger (4) the uterus was irritable and would easily contract under manipulation.

ACTION OF QUININE

The question immediately arises as to whether quinine is an oxytocic and acts directly on the uterine muscle or not. Clinically for many years past, quinine has been used and still is used in uterine inertia, stimulating the uterus in some cases and failing in others. It is occasionally prescribed in menorrhagia but with no fixed results. Fischer (3) in discussing the use of quinine in malarial pregnant women questions whether the drug has ever caused an abortion in such cases. He believes, however that in non pregnant women it may cause too frequent periods and excessive flow at regular periods. In the few patients he has treated with quinine for menorrhagia, the results have been gratifying but the few cases do not warrant the drawing of too definite conclusions.

The exact innervation of the uterus is not altogether definite. It has been repeatedly demonstrated in the laboratory that if the pregnant uterus is excised and then placed in Ringer's solution or any other physiological solution, the temperature kept constant at 37 C. labor will go on spontaneously until the end even though the organ lacks all body connections. Cases are frequently reported in which there are grave injuries to the spinal cord. Such patients have a noteworthy labor due to the fact that they experience no sensation of pain. A patient of this type was recently seen on the service, 7 months pregnant. She had a motor and sensory disturbance below the tenth thoracic, due to a transverse myelitis. She had no knowledge of the fact that she was in labor until after the fœtus had delivered. Such evidence makes it impossible to doubt that the intrinsic nerve supply of the uterus is sufficient to carry on labor independently of other external nerve supply. We cannot lose sight of the fact, however that there must be a connection with the sympathetic system for it is admitted that extreme emotion may profoundly influence the course of labor either by way of acceleration or retardation.

Guggenhelm (4) has brought out an interesting fact concerning the effect of quinine on the uterus. He used uteri excised from rats for his experiments, placing them in Ringer's Solution kept at body temperature. When quinine was added to the solution he demonstrated two facts, namely there was a definite increase in the tonus and rhythm of the contractions if present though no contractions could be initiated if not already in action the os if not open and patulous, would remain unchanged no matter how long the fundus muscles contracted in other words a long cervix, closed and not taken up would not be effected by the drug. This bears directly upon the question as to whether quinine can initiate labor or influence the condition of the cervix.

The most recent work has been done by Acton (5). He was especially interested in women who

	Time of Direct Labor	Length of Labor	Cases
Primipara	½ to 19 hours Average 6 hours	6½ to 9 hours Average 11 hours	60
Multipara	10 1 hours Average 3 hours	2 to hours Average 6 hours	80

	Spontaneous Delivery	Forceps	Version	Pituitary Extract	Position			
					L O A	L O P	R O A	R O P
Primipara	32	28 { 20 Fœtal distress 8 Delayed Second Stage			40	4	8	4
Multipara	66	8 Fœtal distress	1	3 D & S	52	1	12	4

were malarial and desired to know the effect of quinine medication upon the pregnant uterus. To make the conditions of the experiment conform as closely as possible to those existing when the drug is taken by mouth the quinine was used in alkaline solution. It is probably true that the drug is carried in the alkaline bloodstream as a weak base and utilized as such, hence in experimenting an alkaline solution of the drug should be used. The experimenter took 5 grains of quinine sulphate by mouth and at the end of an hour found that the quinine concentration in his blood was 1 378,000 and at the end of two hours, 1 750,000 This fact would afford an accurate comparison in the use of experimental quinine A quinine solution of 1 42 500 introduced into the Ringer s solution containing the excised pregnant uteri caused violent contractions, almost tetanic in character while in a solution of 1 150,000 merely increased the tonus and rhythm of the contractions without any untoward effects of overstimulation

In labor the longitudinal muscle fibers of the upper segment act as a driving force in expelling the foetus from the uterus, and synchronously with this contraction, the circular muscles of the lower uterine segment are relaxed and stretched to allow the head to pass through the low narrow segment of the uterus In all his work, Acton noticed an effect of the quinine upon the muscle groups, but the os remained closed and unchanged and in exactly the same condition as it was before the addition of the drug His conclusions are that concentrations of 1 150,000 increase the intermittent uterine contractions and if some existing cause such as a patulous or dilated os be present the pressure brought by the increased contraction, in an already irritable uterus having slight contractions (the usual condition of uteri at or near term) it might be sufficient to cause the onset of active labor He does not report the initiation of contractions if they were not already present. Such experimental work would lead one to believe that quinine is an oxytocic although it does not seem to have the power of initiating contractions From a comparison of the experimental concentrations of quinine used and the concentration in the blood when the drug was

definite action upon the uterus.

ACTION OF CASTOR OIL

Among the cathartics castor oil is one of the

mild

both

induc

questionable The most probable explanation is that, in the irritation of the whole gastro-intestinal tract, it brings about peristaltic increase through its local action on the bowel. It may be parenthetically noted here that quinine also has a local irritating effect upon the intestinal tract The disturbance from the increased peristalsis is transmitted to the sympathetic center of the system controlling the intestinal tract The uterine center if there be such a thing is situated near the other low sympathetic centers and is either directly or indirectly affected thus setting up the beginning contractions in a near term and irritable uterus. This explanation is reinforced by the observation that severe diarrhoeas in pregnant women frequently initiate labor Probably the irritation of the castor oil starts the uterine contractions, the quinine then reinforces through direct action on uterine muscle steadying the rhythm and increasing the tonus.

CONCLUSIONS

1 Quinine and castor oil in inducing labor are successful in approximately 50 per cent of cases.

2 Labor should be carefully watched for occasionally there may be tetanic contractions. At the first sign of foetal or maternal distress the operator should be ready to interfere.

3 If there are signs of cinchonism the quinine is to be stopped at once.

4 The most favorable conditions for this type of induction are when the estimated date is due or past, when head is fixed or beginning to fix in pelvis and when the uterus is irritable.

5. The mechanism is due to irritation caused by the castor oil on the sympathetic centers with increased peristalsis and a reinforcement of the rhythm and muscle tonus by the quinine acting directly upon the uterine muscle bundles

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1 Atkinson, J E. Am J M Sc, vol. cxlv.

2 [illegible] Mack,

3

4

5 [illegible] Lancet, 91 Jan. 29

ULCERS ON THE POSTERIOR WALL OF THE STOMACH AND DUODENUM[1] [2]

Symptoms, Diagnosis Technique of Operation

By MOSES BEHREND M D F A C S Philadelphia

No case of ulcer on the posterior wall of the stomach that came under our care was diagnosed as such until operation The patients had symptoms of ulcer of the stomach but the location of the ulcer was not accurately determined until operation The symptoms of ulcer on the posterior wall of the stomach are not so well defined as are those of ulcer on the anterior wall In cases of ulcer on the posterior wall, operation can be postponed longer than in cases afflicted with ulcers on the anterior wall or lesser curvature of the stomach On account of this delay ulcers on the posterior wall become much larger than those found in other parts of the stomach they are not so freely movable and because of their adherence to the contiguous structures, their removal is much more difficult.

The diagnosis of ulcers on the posterior wall of the duodenum presents the same difficulty in formulating a diagnosis as to location as do those found on the posterior wall of the stomach In the former the symptoms are more marked and the patients seek operative relief earlier While it is not of paramount importance to know the exact location of an ulcer before operation still one must be conservative regarding the prognosis after operation for ulcers on the posterior wall of the stomach and duodenum because such ulcers require more extensive operation and this entails greater risk

The tissue surrounding an ulcer on the posterior wall of the stomach is usually so involved that at operation it is often impossible to tell whether the condition is benign or malignant We have in a few instances pronounced ulcers malignant at operation, when much to our surprise the pathologist has reported them benign Unquestionably cancer may follow ulcer of the stomach and of the duodenum but the writer has never observed a malignant ulcer of the duodenum or carcinoma engrafted on a duodenal ulcer Cancer of the first portion of the duodenum is admittedly a rare occurrence, cancer of the second portion is more common but not nearly so prevalent as cancer of the stomach The occurrence of cancer engrafted on ulcer of

[1] Research work performed at the Baugh Institute of Anatomy Jefferson Medical College Clinical work performed at Jewish and Mt Sinai Hospitals

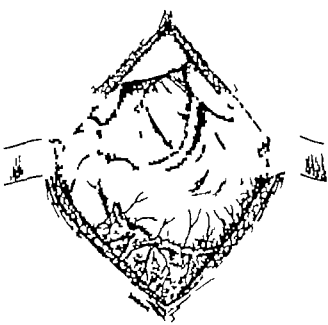


Fig 1 Gastrohepatic omentum has been incised

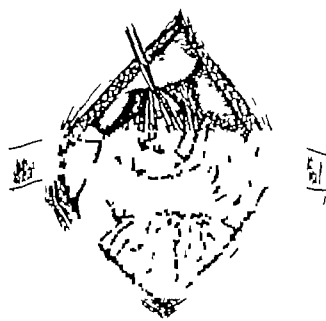


Fig. 2. Posterior wall of stomach has been delivered. Ulcer and portion of wall being excised with cautery

[2] Read before the Philadelphia County Medical Society October 12, 1921.

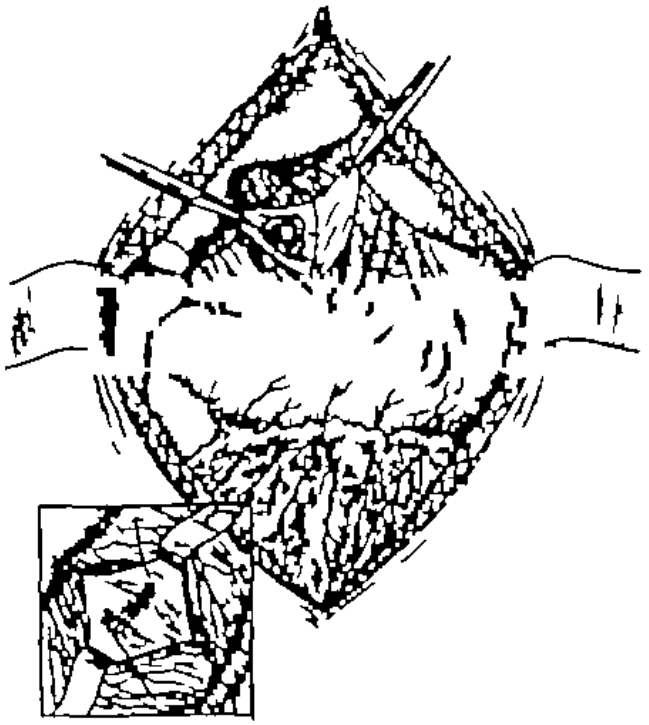


Fig. 3. Excision is almost complete. Insert shows stomach sewed opposite to the incision.

the stomach varies according to different ob-

true in locating ulcers on the posterior wall of the stomach. Even with the patient in the lateral



Fig. 5. The ulcer has been nearly all excised. Insert shows stomach sewed in the opposite direction to the incision.

position except in a few cases. It is impossible to detect an ulcer on the posterior wall of the stomach with the X ray.

As stated, the symptoms of ulcer on the posterior wall of the stomach do not differ materially from those on the anterior wall. The characteristic symptoms of "indigestion," pain immediately after eating, vomiting, and hæmatemesis usually stamp the condition as one of gastric ulcer.

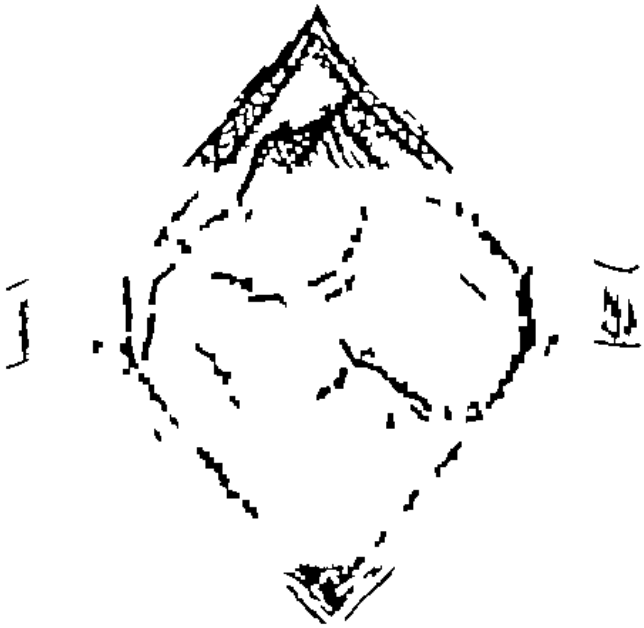


Fig. 4. The gastrocolic omentum has been opened. The ulcer-bearing portion of the posterior wall of the stomach has been delivered.

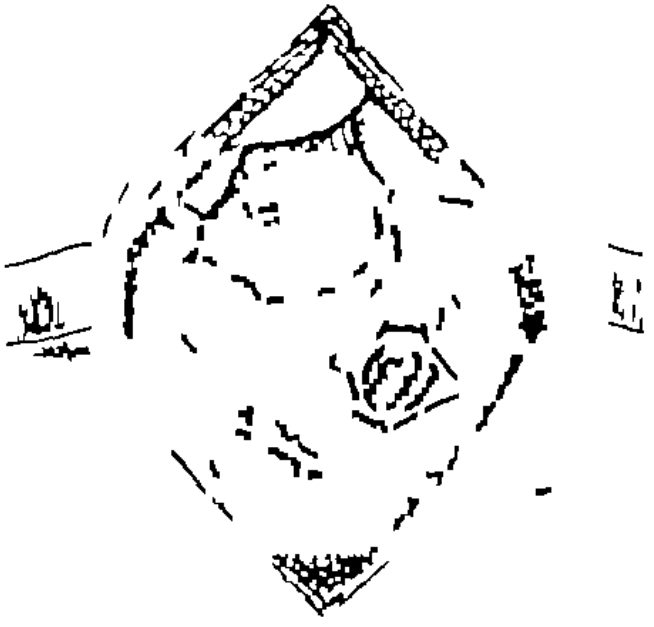


Fig. 6. Transgastric method of attacking an ulcer on the posterior wall of stomach. Note Lembert sutures in mucous membrane which, completed, cover the ulcer.



Fig. 7 The transverse mesocolon has been incised and ulcer with posterior wall of stomach, has been delivered



Fig 8. Excision almost complete Insert same as above.

The cardinal symptoms of duodenal ulcer do not differ even if the ulcer is situated on the posterior wall of the duodenum Pain an hour or two after eating and relief after taking food are characteristic.

The diagnosis between ulcers of the stomach and duodenum and gall bladder disease is simply mentioned to remind one of the possibility of mistaking these affections one for another

ULCERS ON THE POSTERIOR WALL OF THE STOMACH

Ulcers on the posterior wall of the stomach may be approached from several anatomical landmarks. Some prefer attacking the ulcer through the gastrohepatic omentum (Figs 1 2 and 3) others select the gastrocolic omentum (Figs 4 and 5) more easily removed by going through the lesser omentum others again may be more easily removed through the greater omentum If the ulcer is not adherent to underlying structures, the routes just mentioned are to be preferred but if we encounter an ulcer that is firmly plastered to the parietal peritoneum pancreas and other vital structures the transgastric operation has a distinct field of usefulness.

Briefly the superior route consists in the following steps The gastrohepatic omentum is incised the right hand being employed to push the stomach upward until the ulcer is reached The ulcer is then removed by means of the cautery the stomach is sewed in the opposite direction so as to prevent encroaching too much on its lumen (Figs. 1, 2 3 and Insert) In the inferior method the gastrocolic omentum is incised, and the method of procedure is reversed the left hand being used to push the stomach downward and the ulcer is treated as mentioned before (Figs. 4 and 5) One of the best methods of attacking ulcers in this situation is the route through the transverse mesocolon. Here we follow practically the same procedure that one uses in performing a gastro-enterostomy In performing operations in this situation, extreme care must be taken not to injure the middle colic artery

The last method is preferable at times to the other two just mentioned because it affords ample room in which to work (Figs. 7 and 8)

The transgastric method of treating ulcers of the posterior wall has given considerable satisfaction It is absolutely necessary at times to use this method on account of the close adherence of the ulcers to the posterior parietal peritoneum and contiguous structures An incision is made on the anterior wall of the stomach, the edges are retracted and the ulcer plicated being completely covered by at least two rows of sutures



Fig. 9 The duodenum has been mobilized and clamped (Ochsner)

Fig. 10 The stomach has been mobilized and clamped A purse-string has been used on the duodenum, the stump has been inverted (Ochsner)

Fig. 11 The ulcer bearing area has been removed. (Ochsner)

This method has given us some of our best results. The patients have rapidly increased in weight. One patient must be mentioned particularly as he gained 25 pounds in weight and returned to the hospital as an orderly

A gastro-enterostomy has never been performed after an operation for an ulcer on the posterior wall of the stomach It is not necessary because the lumen of the stomach is not encroached upon to any appreciable extent. After the ulcer is removed the stomach is sewed in the plane opposite to the incision in the stomach

ULCERS ON THE POSTERIOR WALL OF THE DUODENUM

Ulcers on the posterior wall of the duodenum are not so easy to handle technically as those on the anterior surface. Ulcers on the anterior wall

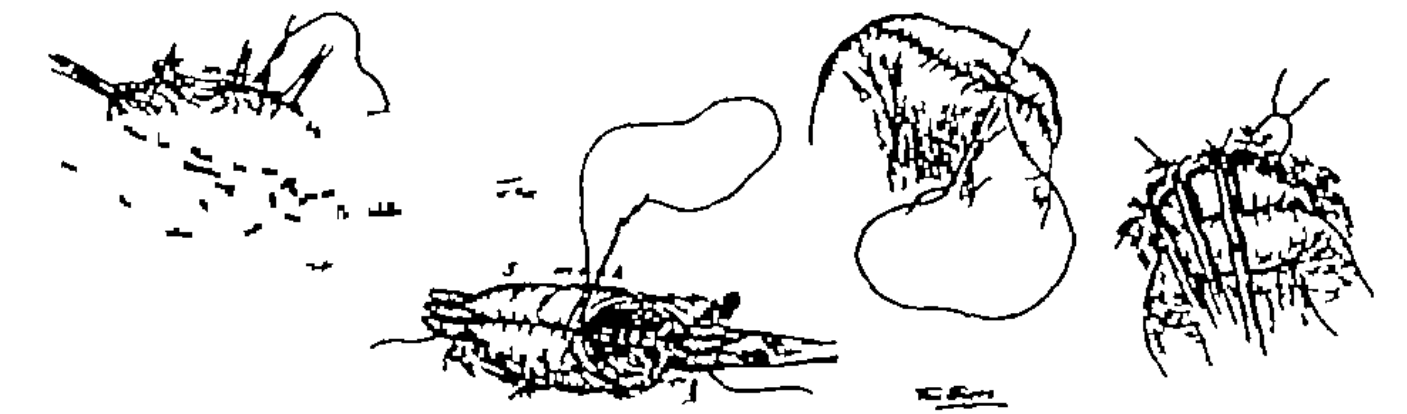


Fig. 12 By means of a three bladed clamp a posterior gastro-enterostomy is performed, (Ochsner)



Fig 13. The completed operation (Ochsner)

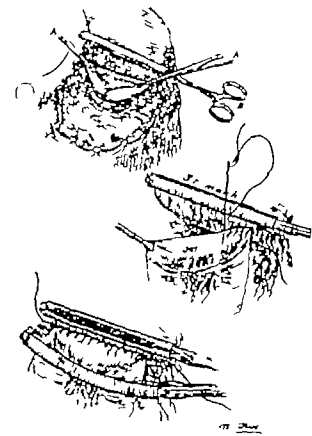


Fig 14 Bringing the jejunum to the cut end of the stomach as in the Pólya operation. (Ochsner)

can be excised readily and the cut edges brought together On the posterior wall however on account of more or less fixation to the underlying structures by means of the peritoneum, together with the added inflammation, an excision of the entire ulcer bearing area, is, to my mind the procedure of preference I have used the technique described in an article by Ochsner in the *Surgical Clinics of Chicago*, October 1919 While the illustrations show the ulcer nearer the pylorus than the duodenum, the various steps of the operation are performed in a similar manner In the first illustration the duodenum is mobilized then clamped above and below the ulcer bearing area. The diseased portion is then excised by means of the cautery the distal and proximal ends are closed, a purse-string suture is placed about an inch from either end, and then the sutured ends are inverted the purse string is pulled taut, and a few running sutures close the remaining aperture. In some cases when the ulcer encroaches on the stomach itself it may be necessary to mobilize the stomach to a considerable extent and instead of performing a posterior gastro-enterostomy the jejunum may be brought up through an incision in the transverse mesocolon or over the transverse colon and attached to the cut end of the stomach anteriorly This is commonly known as the Pólya operation (Figs. 9 to 14)

Another method of treating the open ends is to perform an end to-end anastomosis of duodenum and pylorus followed by a gastro-enterostomy, a pyloroplasty or a gastroduodenostomy

posterior gastro-enterostomy is always performed unless end to-end anastomosis is done or possibly some other technique such as the Finney or Horsley operation.

CONCLUSIONS

Greater accuracy should be sought in the diagnosis of ulcers on the posterior wall of the stomach and duodenum

The surgeon must be prepared to treat ulcers on the posterior wall of the stomach by any one

are best treated by an excision of the duodenum

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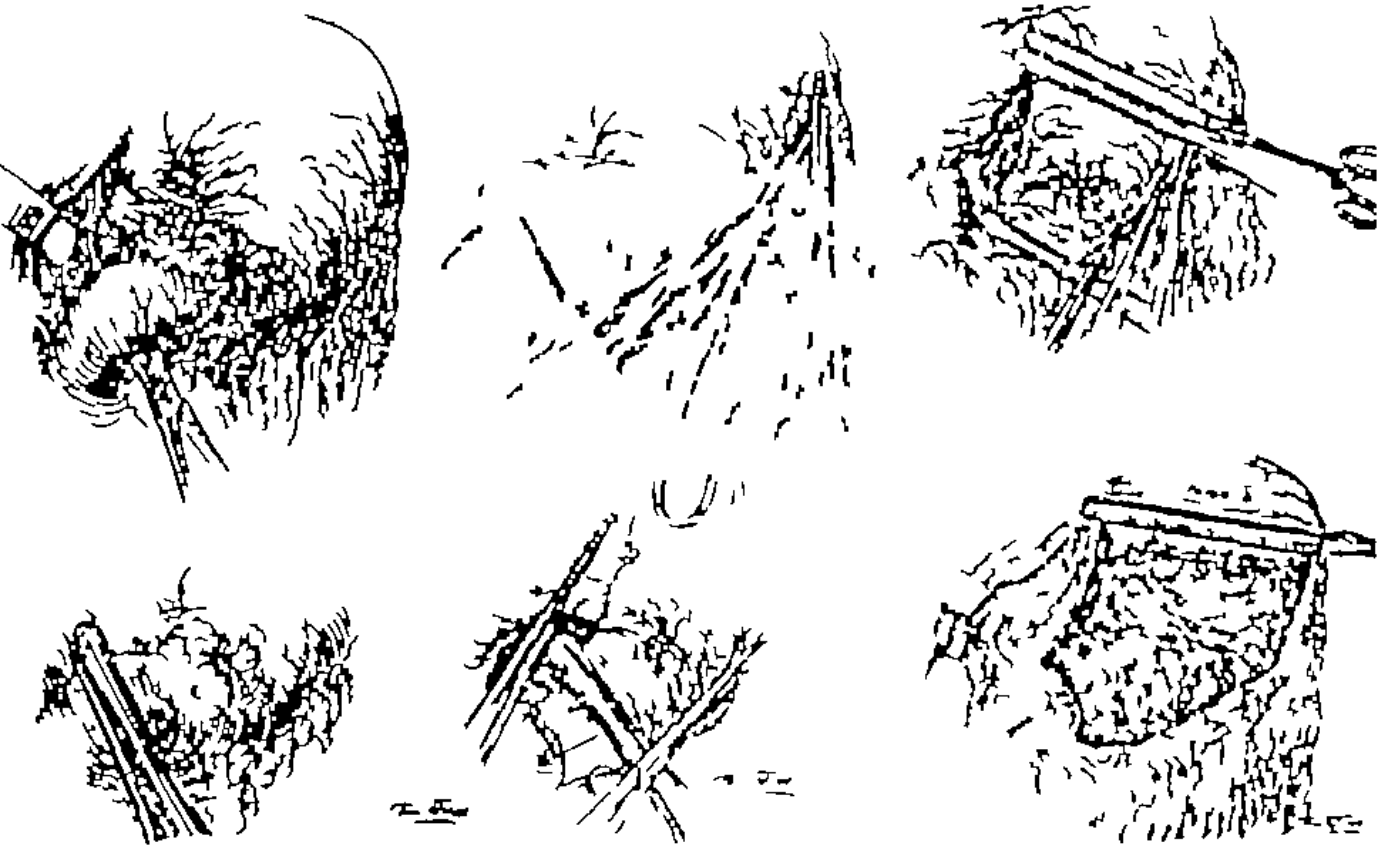


Fig 9 The duodenum has been mobilized and clamped (Ochsner)

Fig 10 The stomach has been mobilized and clamped A purse-string has been used on the duodenum, the stump has been inverted (Ochsner)

Fig 11 The ulcer bearing area has been removed. (Ochsner)

This method has given us some of our best results. The patients have rapidly increased in weight. One patient must be mentioned particularly as he gained 25 pounds in weight and returned to the hospital as an orderly

A gastro-enterostomy has never been performed after an operation for an ulcer on the posterior wall of the stomach It is not necessary because the lumen of the stomach is not encroached upon to any appreciable extent After the ulcer is removed the stomach is sewed in the plane opposite to the incision in the stomach.

ULCERS ON THE POSTERIOR WALL OF THE DUODENUM

Ulcers on the posterior wall of the duodenum are not so easy to handle technically as those on the anterior surface Ulcers on the anterior wall

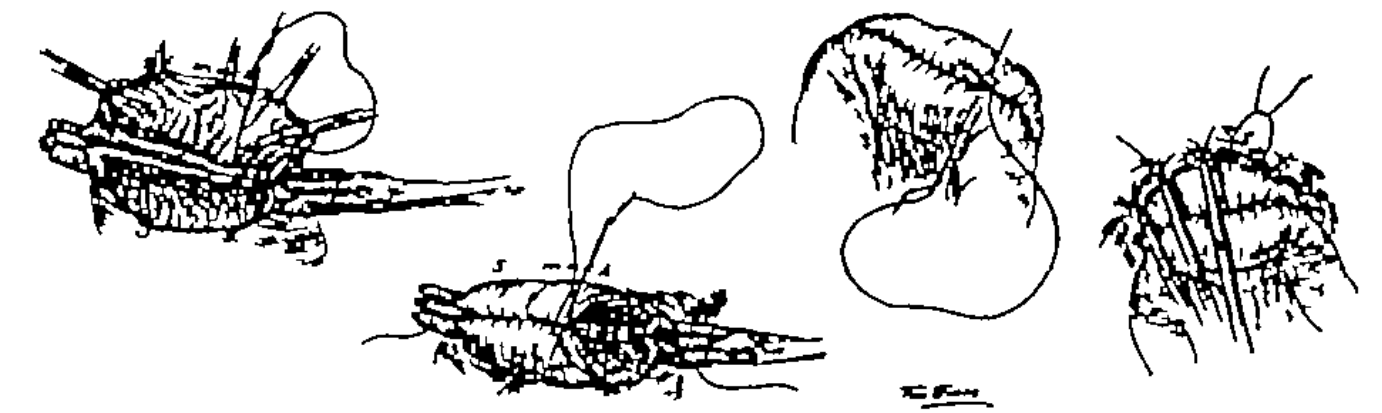


Fig 1 By means of a three bladed clamp a posterior gastro-enterostomy is performed, (Ochsner.)

sulation of the escaping contents are liable to be ineffectual or may lead to the development of a subdiaphragmatic abscess

Perforation of the gall bladder into the free peritoneal cavity is often fatal, not from inherent causes, for bacteria which have passed through the liver to reach the gall bladder are greatly reduced in virulence but because, as a rule, the gall stone attacks so closely resemble the attack that ends in perforation that they are attributed to gall stone colic and the patient is allowed to drift for some days before the real difficulty is recognized

Simultaneous perforations of the gall bladder and appendix are rather common The rule is that the patient has gall stones An acute infection of the appendix permits the passage of bacteria into the portal circulation and the gall stone infested gall bladder rapidly becomes involved In a large percentage of such cases the infecting organisms belong to the colon group and cause a foul fæcal odor, in these cases the appendix should always be examined for coincident perforation

Frankness in dealing with the patient, the family, and the friends is the wise policy When those interested understand the slight risk of operation in the early stage, and that the responsibility for delay must be borne by them and not by the physician they, as a rule, become amenable to reason

William J Mayo

THE TREATMENT OF CHRONIC MALIGN DISEASES OF LYMPH GLANDS

CHRONIC malign diseases of lymph glands are protracted contests between bacterial or neoplastic parasitic cells acting upon the offense either separately or in combination, and the tissues of the host reacting upon the defense The unaided powers of defense are never adequate to produce spontaneous recovery However gradually one of these diseases may begin and progress and however effectively the defensive reactions may intermittently check its advances or even induce temporary regressions, if the process is malign for the individual affected the end result is the same Eventually a progressing incapacity of sources of reserve powers of resistance, which are resident in the hæmatopoietic structures, is caused by prolonged toxæmia Henceforth increasing disability and death are inevitable

Three types of diseases are in this category granulomata (tuberculosis), neoplasmata (carcinoma), and the group intermediate between granulomata and neoplasmata (Hodgkin s disease, leukæmia, lymphosarcoma, etc) All three have much in common They become established only in susceptible individuals, i e those having some biological deficiency Their modes of offense and the defensive responses provoked are similar or identical Their ultimate effect upon untreated patients is the same Their two great points of difference, etiology and histopathology, are of little consequence to the afflicted who are in need of permanent symptomatic relief

The present general dissatisfaction with the results of treatment is largely attributable to misconceptions of the pathogeneses involved Too much attention has been focused upon the morbid process and too little upon the patient s defense A combination of the two, offense and defense constitutes disease, the control of which is the real problem to be solved

Seeking for "cures" of malign diseases is scarcely more rational than Ponce de Leon's search for the fountain of youth A cure means an elimination of a malady so complete as to preclude all possibility of a recrudescence Facts now established prove that

cures of tuberculosis are in reality but symptomatic recoveries because living tubercle bacilli persist and are demonstrable postmortem no matter how perfect or how prolonged a recovery may have been Likewise it is known that recrudescences may occur after long intervals of latency during which there has been faulty presumptions of cure It is becoming more evident that similar conditions obtain in cancer and in diseases of the Hodgkin s type and that actual cures of these maladies are not only rare but no more satisfactory than symptomatic recoveries Latent periods of 30 and of 11 years have been noted in cancer and Hodgkin s disease respectively and many cures have been erroneously proclaimed after shorter intervals of symptomatic relief Pursuits of mythical panaceas have obscured possible attainments with methods at hand Malign diseases can be converted into benign diseases at least temporarily The duration of the periods of benignancy is determined by both the degree of malignancy or the relative preponderance of powers of disease offense over individual defense at the time treatment is begun and by the thoroughness of the treatment.

If treatment is to provide every opportunity for lasting recovery three accomplishments are prerequisite first step an elimination of the portal of entry or of the initial lesion second step a material subtraction from the bulk of the disease (lymphoma) and finally the third step an increase in defensive powers of individual to highest possible level which level should be permanently maintained

The methods in vogue to accomplish the first step are extirpation cauterization, and radiation. Each has its advantages under certain conditions In general clean excisions are the more certain to be effective to permit of the smoothest healing and to interfere least with the third step

The methods being used in the second step to combat the lymphomata are excision radiation and various forms of heliotherapy *Excision is the method of choice If more than* transient palliation is still possible

Halsted has established the achievements as well as the limitations of surgery Steps one and two can be accomplished in so far as securing permanent freedom from disease in the areas subjected to operation and no farther These local or regional cures are assured only when the extirpations are complete which means a removal of all lymph glands, gland-bearing and disease-bearing tissues within and just beyond the frontiers of the affected area Thus has been proved the true conservatism in combatting malign affections namely the utmost operative radicalism There need be and should be no handicap to increase of resistance after these operations On the contrary local and general resistance will be augmented by proper and prompt excisions. Such operations suffice to initiate improvement that can amount to recovery if step three be not neglected

Radiation either by X-ray or radium is invaluable in treating certain initial lesions that cannot satisfactorily be excised or cauterized and in reducing the size of lymphomata that cannot be extirpated Defects in present radiotherapeutic methods have restricted the indications for its use at least temporarily Emanations may fail to control and can even stimulate the activity in initial lesions. Disease processes within malign lymphomata can be modified but not destroyed by radiation and sooner or later can not even be controlled Radiotherapeutic doses now generally held to be effective are injurious to the hæmatopoietic system Consequently if the lymphomata are benefited general resistance is reduced and progress of the morbid process is ultimately fostered

The question of postoperative radiation of areas excised can be answered If the extirpation has been complete radiation can only do harm, if it has been incomplete transient benefits are conceivable

Heliotherapy is of great value in after treatment because of beneficial effects upon both local and general resistance Increased activity of erythroblasts and lymphoblasts is obtainable and invaluable as is also local hyperæmia. The balance of after treatment which must be persistent because the biological defect that makes the disease possible is as a rule inherent if not inherited includes all details that make for unusually healthful living Methods employed in the treatment of tuberculosis suffice

Better results follow as methods improve The greatest obstacle to progress is therapeutic pacificism, usually called conservatism, by the blood-shy and those unwilling to see and to face facts Earlier diagnoses are required, not so much of the exact nature of the affection but as to whether it is malign or benign The more promptly a malign process is recognized the less the degree of malignancy of that disease in the patient and the sooner the most radical treatment warranted by conditions is instituted the better the prospects for recovery Few fatalities will result if benign diseases be treated as if they were malign On the contrary procrastination in radical treatment of malign diseases condemns the great majority of patients to greater distress and danger if not to death

The principles involved in exact methods of treatment need only to be understood to be accepted and applied So long as a person is anatomically normal, physiological abnormality and disease is impossible Morbid anatomical states assure morbid physiological processes A restitution of normal or approximately normal anatomical conditions is the keystone of recovery and produces recovery in benign diseases Successful treatment of malign diseases requires additional measures The basic cause of these maladies is an unknown somatic weakness, and the secondary factor is the presence of parasitic cells which cannot as a rule be entirely removed or destroyed Consequently there must be anatomical readjustment not to, but beyond normal—a compensatory lymphoblastic hyperplasia induced by extirpation so there may be an overcorrection opposed to the inherent weakness Surgical reconstruction is required to start recovery Continued after-care to enhance and to protect general health is almost equally necessary to make that recovery permanent J L YATES

AMERICAN COLLEGE OF SURGEONS

SOUTH AMERICAN SURGEONS

REPORT OF OFFICIAL VISIT TO BRAZIL, URUGUAY ARGENTINA CHILE PERU AND PANAMA BY FRANCIS P CORRIGAN A.B M D F A C S CLEVELAND OHIO

IT is my privilege to report to the Fellows of the American College of Surgeons the present status of our Pan-American development The movement to embrace the South American countries in this great guild, which is organized to elevate the standard of surgery was inaugurated in 1920 by Dr William J Mayo and Dr Franklin H. Martin. Dr Martin, accompanied by Dr Thomas J Watkins and the writer returned to the field in 1921 The present article is the third chapter of the story of this scientific inter-relationship

The movement described as Pan-American had its birth in Faneuil Hall. The American Declaration of Independence and the succeeding world-stirring political events had its result in the present group of North and South American nations. They have in common the political ideal that governments derive their just powers from the consent of the governed The first Pan American manifestation was political. The leaders of the movement that brought about the independence of the South American countries, men like Simon Bolivar San Martin and O'Higgins were practically all men who had been here personally or had at least imbibed the ideas of Washington, Jefferson, Franklin, and the other great founders of the United States. There was at that time and for many years thereafter a strong current of sympathy between those countries and the United States

The second phase of the movement was commercial interchange Commerce although the life-blood of nations, sometimes carries in its current annoying parasites The commercial relationship in the main healthy has too often been marred by individual selfishness

The present phase of the Pan-American movement is cultural. It is characterized by interchange of ideas in art, literature, and science. It is interested in the beautiful and the true. It seeks by closer acquaintanceship to develop real friendship and to share useful information. For North Americans to understand South Americans, and vice versa, and thus approach real friendship it is necessary that each divest himself in a measure of his own very different environment

In the United States the houses all have chimneys, was the unexpected answer I received from a resident of the tropics when I asked him what feature in the United States had most impressed him on his first visit. To the majority of Americans nothing could be more ordinary than chimneys on houses To him it was a peculiar feature of the landscape

I narrate this little incident to show how dissimilar environments may be and how essential it is for each to respect the other's point of view If therefore, one goes into these countries in a spirit of intellectual snobbishness with the idea that one can learn nothing, it is certain that one will not be disappointed It is equally certain that the intelligent, open-minded man will find much to admire and to imitate For instance, the method of handling problems incident to tropical climates might be utilized with benefit in some of our hot Southern states.

The scientific bodies of North and South America have been rather diffident in their approach. Science is not as brash or as self confident as commerce because true science realizes its limitations and is duly humble It may be for this reason that it has been well received

Some idea of the influences now operating toward a genuine scientific reciprocity between North and South America might be gained by scanning the list of my fellow passengers on the SS Aeolus which sailed from New York on February 2 1922

Dr R ch rd P rs n of h C m n F

on their way to Brazil to pass around any useful information that they might have At least such is the description of the great work of the Foundation as expressed by its modest founder

Specifically, these gentlemen were on their way to render such aid as the Brazilian government might desire in furthering the program of sanitation and medical education which it has under way

Dr Mark Boyd an expert in malaria control, accompanied by Mr Estus Magoon a sanitary engineer, have been engaged by the Brazilian government to make a survey of the situation with regard to the elimination of malaria which is so prevalent in all tropical countries. Miss Clara L Kieninger and Miss Louise M Pitz, American nurses, formerly of the American Army in Fr
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government, are charged with the heavy responsibility of inaugurating a nurses training school in a government hospital in Brazil. This is the first attempt to establish such a school according to American ideas, and much depends upon its success. Dr Paulo de Proenca, a young Brazilian doctor was returning after spending two years in the laboratories of American universities to take up his work in the Oswaldo Cruz Institute, the great research laboratory of Rio de Janeiro

As representing interests other than medicine, I might mention Professor Edwin W Kemmerer of Princeton University who was on his way to confer with representatives of various South

the United States government to the exposition which is to be opened in September of this year in celebration of the Centennial of Brazilian Independence. The United States government has appropriated one million dollars toward this celebration, a part of which will be expended in the erection of an exposition building This building is to be a permanent structure and after the exposition it will house the American Embassy Our extensive participation in this celebration is not more than the repayment of a courtesy as Dom Pedro then emperor of Brazil, was the only actual head of a government who personally visited our Centennial in Philadelphia in 1876.

Such are the influences which are bringing about between the two Americas a new era of understanding and friendship

Rio de Janeiro Brazil

At Rio de Janeiro after a pleasant two-weeks' voyage we were met by a committee of medical men who boarded our ship to greet us. This committee was made up of men interested in sanitary problems, medical men who came to meet the representatives of the Rockefeller Foundation and surgeons (headed by my *friend* Dr José de Mendonça) who came to meet me as the representative of the surgeons of North America. Others of the committee were Dr Carlos Chagas of the Oswaldo Cruz Institute Dr Oscar Clark Dr Hackett, and Dr Bowman C Crowell of the International Health Board.

The usual asperities and inconveniences of passing through the Custom House having been considerably ameliorated by our kind hosts I was escorted to the very comfortable Palace Hotel by Dr José de Mendonça, Dr Oscar Clark and Dr Jayme Poggi I will not attempt to describe the arrangements that were made for my entertainment the pleasant hours spent nor the delightful excursions which I made accompanied by my kind hosts, to the many beautiful places around the bay the wonderful botanical gardens and other things with which my time was filled preliminary to our conference. I will say a word only of the new St. Francis de Assisi Hospital which is being rebuilt by the Brazilian government and in which a modern nurses training school, based on the principles of training schools in this country is to be installed This reorganization represents to my mind the beginning of a new era in the history of Brazilian hospitals

I cannot forbear a few remarks about Corcovado and the wonderful view which may be had from the top of that mountain. I can best describe it as an ideal place for a honeymooner and his bride where they may hold hands until the sun has set beyond The Fingers of God a mountain across the Bay of Rio de Janeiro and watch
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was named the 'River of January' by the Portuguese sailors who first discovered it in the month of January They erred in their belief that they were at the mouth of a great river The city of Rio de Janeiro is strewn helter-skelter in the valleys between the mountains. The charm of

many mountains among which the city lies are covered with virgin forests. The water wends its way from the mountains and is pure and soft. Since the elimination of yellow fever by Dr Oswaldo Cruz, health conditions have been excellent Infant mortality is still high but outside of this, the general mortality is comparatively low

The formal conference of the Rio de Janeiro

secretary After I had completed the pleasant duty of extending the salutations and greetings of the Fellows
three points w

1 *The future*
   a Its numerical extension
   b Method for extending Fellowship to men in all sections of Brazil who meet the requirements of the College

xii The committee in Rio de Janeiro agreed to

2 *The Cruise of the Fellows of the American College* The proposed expedition to South America in February 1923

All who were present expressed their gratification and extended to the American College of Surgeons a hearty invitation I informed them that their colleagues, the leading surgeons of the United States and Canada would take advantage of the opportunity to participate in the Centennial of the Independence of Brazil and that they would visit the Exposition which will be a feature of that Centennial and in which our government expects to take prominent part.

3 *Prospects for hospital development and progress in Brazil*

We discussed the hospital standardization program of the College. How was it being received and what steps if any were being taken to bring about its adoption? Their response was most encouraging The Public Health Department of the Brazilian government is just completing the new hospital of St Francis de Assisi. This hospital as I mentioned above will have a modern training school organized by competent American nurses I have since had an opportunity to inspect the hospital which will be opened within a few weeks While it is an old building which has been remodelled, on the whole it is very good Dr de Mendonça has prepared a complete program for the erection of four new hospitals of one thousand beds each which are to be located in four separate sections of the city The plans for these hospitals conform very closely to our standard This program has been incorporated with every

Penitencia Hospital which consists of a few old buildings which house about forty beds, is to be replaced by a two hundred and fifty bed hospital. The plans which I have seen are being prepared under the direction of Dr Fernando Vaz, a Fellow of the American College of Surgeons and as he himself says, half American" The Penitencia has an ideal location and the monks who own it have in hand the necessary funds and the building will be under way in about two months. The institution will be a splendid one and Dr Vaz contemplates organization along the most modern lines. If these plans materialize (and it appears that they will) the hospital situation in Rio de Janeiro will be revolutionized within the next five years Dr Vaz and his associates also have under construction a magnificent medical and surgical clinic in which they propose to institute group practice for their private work.

The surgical services in Brazil as in all of South America are organized by wards instead of by hospitals Surgery on the Southern continent has been largely influenced by Parisian methods It is the French system of individual artistry as compared with the American system of team-work or group practice The French method develops individual surgeons rather than a system of surgery

On Wednesday February 22 Dr Russell, Dr Pearce, and I were tendered a farewell *almoco* (breakfast) at the Jockey Club Professor Miguel Couto presided and Dr Chagas was toastmaster Among the honored guests was Mr Edward Morgan, the American Ambassador About forty of the leading medical men of Rio de Janeiro attended. As indicating the spirit in which we were received I quote verbatim from the address by Dr José de Mendonça

nected, establishes medical missions, laboratories, hospitals, and medical colleges, and aids all useful things that have been accomplished in this line all over the world, the Col-

Dr Corrigan, this luncheon which is offered also to you as representative of the American College of Surgeons, signifies a hearty hand-shake from the Brazilian surgeons to their brothers of North America, to the prosperity of the American College of Surgeons, and to the good fortune of the Rockefeller Foundation

With such messages ringing in our ears, Dr Russell Dr Pearce and I departed from Rio de Janeiro on the night train for São Paulo

São Paulo Brazil

Arriving in São Paulo on February 23 we were met in the poetically named Estacão da Luz (Station of Light) by a large gathering of medical men, including Dr J Alves de Lima, chairman of our committee on credentials, and Dr Benedicto Montenegro secretary also Lieutenant Tenorio de Brito, representing the president of the state and Dr José Lannes representing the secretary of the interior

São Paulo is situated at an altitude of nearly 3,000 feet, and the weather seems delightfully cool Our visit was taken very seriously indeed Representatives of both the Rockefeller Foundation and of the American College of Surgeons having arrived on the same train, good material was provided for the newspapers. I had notified the São Paulo surgeons by telegraph that I would arrive in their city on the morning of February 23 and they arranged a conference for the evening of that day

We were escorted to our hotel by the committee, and in accordance with the hospitable custom which is in vogue everywhere in São Paulo the greatest coffee state in the world, we all had coffee At 3 30 in the afternoon we had an audience with the president of the state of São Paulo Dr Washington Pereira de Souza, a tall, handsome distinguished looking man with gray moustache and imperial also with the secretary of the interior Senhor Alarico Silveira States rights obtain strongly in Brazil, and the important state of São Paulo has an almost independent government comprised of a president and a complete cabinet. The president of São Paulo is always a logical candidate for the president of the nation

Before going to the meeting in the evening I enjoyed a family dinner at the home of Dr de Lima whom I had met in Philadelphia. This di
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children all of whom converse fluently in English

Dr de Lima has a wonderful collection of plates, one from the great Napoleon s table and other examples of the first products of Sevres and Delft. They are artistically distributed around the walls of the high-ceilinged dining room On the walls of the living room where we adjourned for our after dinner liqueur was a collection of steel armor and weapons which belonged to the knightly ancestors of the family

After dinner we went to the headquarters of the Society of Medicine and Surgery of São Paulo to meet with the committee. Dr de Lima presided

Lindenberg were absent from the city and Dr Baetas Neves was confined to his bed. In general the same things were considered as at the Rio de Janeiro meeting The suggestion of expansion of activities brought up the question of division of jurisdiction between the São Paulo and Rio de Janeiro committees. Dr de Lima suggested that São Paulo control the states of São Paulo Santa Catharina Rio Grande do Sul Parana Goyaz Matto Grosso and Minas Geraes, seven in all, leaving Rio de Janeiro in control of all of the northern states fourteen in number

Dr Benedicto Montenegro our very active and intelligent secretary a graduate of the University of Pennsylvania School of Medicine was instructed to undertake the correspondence necessary to get into touch with the eligible men in other parts of the state of São Paulo I was gratified at their genuine interest and enthusiasm for the work of the College and the conscientious way in which they approached the problems. When told about the proposed cruise the surgeons of São Paulo were very enthusiastic in extending an invitation to their North American confrères. *I am sure many of the Fellows will take the interesting ride from Rio de Janeiro to São Paulo and* then down over the wonderful silver-plated road to Santos The trip will repay them for their efforts and they will indeed be very welcome in São Paulo There is considerable friendly rivalry between Rio de Janeiro and São Paulo which results in a healthy competition. They will strive to outdo each other in their hospitality

On the second day of my stay in São Paulo after a trip to some of the hospitals of the city and to the famous snake farm I was entertained by the Fellows of the College at an *almoco* in the Automobile Club São Paulo s rapid growth has not been accompanied by a corresponding development of hospital facilities The principal municipal hospital is lamentably overcrowded In most of the wards, there are as many patients lying on mattresses spread on the floors as there are in beds. There is as yet no adequate plan for remedying this condition as there is in Rio de

Janeiro The medical profession, however is not to blame. It is simply another example of the weakness of the system of control by politicians over activities that should be supervised by technical experts.

Both Rio de Janeiro and São Paulo, the two

Industrial war Brazil the United States for manufactured articles Bad conditions beget their own remedies You can now buy clothes, shoes sterilizers, bath tubs, plumbing goods and so on of native manufacture much cheaper than the imported article. Agricultural development is also proceeding rapidly As a proof of alertness along this line, I heard that poison gas was now being used by the south Brazilian farmers to destroy termites and other insect enemies It would be strange if this terrible destructive agent might yet prove to be a great boon to mankind Brazil is already a great manufacturing and exporting nation, and Rio de Janeiro is destined to become the New York of South America. The spirit of friendliness in Brazil for all things American was very marked.

Montevideo Uruguay and Buenos Aires, Argentina

I left São Paulo at 8.40 a m on February 26 and, after a most interesting ride over the wonderful railroad to Santos, which has been so well described by Dr Martin, I embarked on board the Italian steamer Principessa Mafalda," bound for Montevideo and Buenos Aires. During the few hours that our ship remained in Montevideo I got into touch with Dr Enrique Pouey the chairman of the credentials committee for Uruguay Without realizing the difficulties into with him m it be

afalda, I arrived in the busy harbor of Buenos Aires at about one o clock the following afternoon, Tuesday February 28 I went immediately to the Plaza Hotel, and after finding that the river boat for Montevideo was due to leave at 10 p m., I proceeded to the telephone as I would at home, and got into touch shortly with Dr Rodolfo Pasman, the secretary of our committee.

While waiting for Dr Pasman, I thought to improve the time by looking up my passage back to Uruguay I descended to the lobby and asked the hotel porter to secure my ticket and reservation back to Montevideo But have you a *cédula de identificacion* (identification seal)?" I learned that this was a necessary document without which I could not purchase a ticket to Montevideo and return The Police Department was called—it was a holiday—Mardi Gras in fact. I was advised to go to the Police Department myself I did so but came back empty handed with instructions to return at 4 30 p m. Meanwhile Dr Pasman came along After we had a talk about American College affairs he accompanied me to the Police investigation bureau. Finally after several trips, at seven o clock in the evening, we got the necessary provisional certificate.

I learned from Dr Pasman and Dr Robert Halahan whom I had known since the Montreal meeting that it was vacation time and most of the men that I wanted to meet were still out of town We arranged a conference for my return. So after nine busy hours in Buenos Aires, I started back across the Rio de la Plata on a speedy river ship called the Cabo Corrientes

I was received in Montevideo by Dr Enrique Pouey who came to greet me and to welcome me to Uruguay He announced that our meeting was arranged for 10 a. m

I was given a rousing reception and literally greeted with open arms by a lot of splendid fellows. Those who were present at the meeting were Dr Enrique Pouey Dr Alfredo Navarro Dr Manuel Albo Dr Julio Nin y Silva Dr Juan Pou Orfila. Dr Pouey presided We discussed in general the same subjects as were discussed at the other meetings Afterward, I was taken for a drive around the city through some of the beautiful boulevards and parks One of the newer shore drives which leads out to the famous Pocitos Beach is called Avenida Woodrow Wilson.

hospital buildings is the new children s pavilion only recently completed. The walls are decorated with large mural paintings illustrating familiar nursery rhymes. It is a very pleasing departure from the conventional plain hospital walls We then returned to the hotel for an *almuerzo* with a larger group of Fellows.

At the hotel I was greeted by Dr Garcia Lagos, who was still limping after a serious horseback

accident This was his first time out since his accident and he pleaded his injury as his reason for not being the first to greet me, and he sent his regards to his many friends in North America.

We had a splendid meeting and all of the Fel lows who did not attend sent formal regrets, giving reasons for their unavoidable absence

Everything was pleasant in Montevideo, the doctors the city and most of all the warmth with which they received my news. They invited us with the utmost cordiality to visit them next year They are all deeply interested in the College and they are a lot of fine fellows. It was with regret that I left this pleasant capital of the Republic Oriental.

limits its membership to recognized surgeons of good repute. In fact I learned that the requisites for admission are very similar to those of the American College of Surgeons. Men possessing similar ideals must naturally be in harmony with the spirit of our great movement for the advancement of surgery

In company with Dr Pasman I visited some of the hospitals Many of the senior surgeons were still away on vacations. The surgical serv ices were in charge of the younger group of men. I saw some very good work done by men of this group Dr Villegas, Dr Pasman Dr Arano and the younger Dr Finochietto They are the com ing leaders of surgery in the Argentine, and form a very creditable representation for any country

I had a most satisfactory interview with Dr José Arce, who has recently been made rector of the University Dr Arce is the *Catedrático* which means that he occupies the chair and is head of he, there- view of the He im- pressed me very favorably indeed. He is of fine appearance and gives one the impression of being a capable executive. In response to an inquiry from Dr Arce, I explained to him our under standing of the Fellowship pledge of the College. I also told him that a large body of North American surgeons leaders in their profession, were planning to come to South America next year that they had been cordially invited by the surgeons of Brazil and of Uruguay and I assumed that they would also receive a welcome from their colleagues in Buenos Aires the metropolis of South America

Dr Arce said that he agreed with me entirely about the pledge and assured me that he would call the surgical society together in April and that we could depend upon receiving a cordial invitation from the Argentine surgeons. The suggestion that a new pledge should be drawn up in original Spanish and not translated, as a literal transla tion does not always convey an identical meaning, is well taken

After finishing my work in Buenos Aires I pre- pared to move on to Chile The international train of the Trans-Andine Railroad runs only Wednesday a few diffi the way of delay of consular visés and other technicalities incident to securing my permanent identification seal I had only secured a provisional document for Uruguay which I had obtained under the promise that I would report back and finish the ritual for securing a permanent one before leav ing the country I will omit the details, but it is sufficient to say that they consumed much time and energy

On Saturday morning before my departure I visited the British Hospital in company with Dr Robert Halahan a Fellow of the College. This is an excellent institution maintained by and for the English speaking colony of Buenos Aires. Sir John O Connor and Dr Halahan are the attending surgeons. Dr O Connor was away at the time, but I had the pleasure of seeing Dr Halahan do some skillful work

During my stay in Buenos Aires I was enter tained by a group of surgeons at the famous Jockey Club probably the most noteworthy club on this continent. Dr Pasman also gave me a glimpse of Palermo and the race track and parks in that beautiful suburb The police spoiled a luncheon that had been planned for me at El Tigre, the famous summer resort, as I had to spend most of the afternoon getting my *cédula de identificacion* so that I could leave on the Sunday morning train for Chile.

The Andes

At 8 30 Sunday morning I was off on the Trans-Andine Railroad, across the cattle strewn plains of Argentina. The scenery is rather monotonous after a few hours and there is little of interest until toward evening (the low grounds immense flooded sections with billions of birds, ducks, flamingoes and others in endless variety)

I found the sleeper quite comfortable but was compelled to close the window on account of the almost suffocating dust. It was a rather trying night. Early in the morning the train pulled into Mendoza, the wine center of Argentina Here

we changed for the narrow-gauge road across the mountains The Trans-Andine ride has been described by pens abler for the task After an almost sleepless night it was something of an ordeal for me It was extremely interesting although I did not enjoy it as I should I would

one s while It is a wonderful journey the descent on the Chilean side down the Aconcagua valley being especially interesting

The train arrived at Los Andes at 7 p m one hour late Los Andes is the Chilean terminus for the narrow-gauge road. The *Combinación* for Santiago and Valparaiso leaves at 8 15 p m. so there is a rush and a hurly burly to try and get your trunks past the customs inspectors in time to go to the near by hotel for a bite to eat We had had no diner on our train since lunch time and as there is no diner on the *Combinación*, this was the only opportunity to secure food before Santiago at 11 30 p m. By dint of effort and past football experience, I finally got my baggage through customs and had sufficient time for a hurried meal We arrived in Santiago about midnight, and after a bath and a heavenscent bed, I knew no more until morning

SANTIAGO

At Santiago my first call was on the American Ambassador Mr William Miller Collier In this connection I must express my gratitude to the State Department and the American Diplomatic and Consular representatives of the United States They have always given splendid support and assistance

Ambassador Collier was no exception He arranged an appointment for two o clock with Dr Gregorio Amunátegui dean of the Faculty of Medicine. He also honored me by making an appointment to present me to the president of Chile

I met Dr Amunátegui at his home and had a long conference with him Dr Amunátegui who had been appointed chairman of the credentials committee in Santiago arranged a meeting of the members of the American College of Surgeons for later in the week. This meeting was duly held at 4 p m on March 9 in Dr Amunátegui's home The following men were present Dr Gregorio Amunátegui Dr Luis Vargas, Dr Eugenio Diaz Lira, Dr Francisco Navarro Dr J Valenzuela Basterrica. Dr Amunátegui as dean of the Faculty of Medicine, conducted the meeting, and it was characterized throughout by extreme frankness of expression. Some dissatisfaction was encountered because of the listing of a foreign mining colony with its surgeon who was not licensed to practice medicine in Chile at the head of the Chilean list in the year book of the College

The opinion was expressed that a central committee with jurisdiction over the whole country of Chile would be more effective than one committee in Santiago and another in Valparaiso Having been authorized from the headquarters of the College to make this change the following central committee of seven members was nominated for the whole of Chile

Dr
Dr
Dr
Dr
Dr Guillermo Muenich Valparaiso
Dr Edwyn P Reed Valparaiso

pr
to by them The reception in Valparaiso was very cordial. The meeting was held at the *Club Naval* and was attended by practically all of the Fellows residing in Valparaiso.

Borja, which I inspected with Dr Luis Vargas as my guide, was especially attractive in this respect Each of these large government hospitals has its own kitchen bakery laundry etc and is practically an independent village In each there is a pavilion for private patients The rates for *pensionistas* as paying patients are called, is extremely low Of course the greater part of the hospital is taken up by charity beds. Each has also an out-patient department The assistants remain

do two difficult gall-bladder resections. The

on.

Chilean surgical ideals are high. They are not surpassed by any country of South America. Hospital nursing as we understand it, is poorly

stand that this has already been brought about and that several Chilean girls are now in training at Wesley Hospital in Chicago

In company with Dr Amunátegui its dean, I had an opportunity to visit the medical school and meet most of the heads of departments. I also inspected the excellent dental school in company with its able director, Dr Jerman Valenzuela Basterrica I may say that I was very well impressed with the scholarship and ideals of Chilean medical men

In Valparaiso, I visited the Hospital of San Juan de Dios. I was especially interested in the laboratory department conducted by Dr Koch At the time of my visit, he was doing some interesting investigations in spectroscopic examinations of blood serum, seeking a changed refractive index in the serum of suspected syphilitics to check up on the Wassermann reaction It was new to me and very interesting

I also visited the German Hospital and saw the skillful Dr Muenich do some interesting gastric surgery

Before leaving Valparaiso I was fêted at the famous Viña del Mar club and afterward taken to the last race meeting of the summer season The beautiful grass track at Viña del Mar, with its encircling mountains, is famous throughout South America.

Lima, Peru

Leaving Valparaiso on the good ship "Ebro," I proceeded directly to Peru

I had a pleasant and satisfactory session with our committee in Lima. Our meeting took the form of a luncheon in the restaurant of the Zoological Gardens, with a business session following Dr Juvenal Denegri presided Among those present were Dr Guillermo Gastañeta, Dr Francisco Graña, Dr Miguel C. Aljovin and Dr Carlos Morales. Dr Carlos Vilaran I learned, was abroad and Dr Constantino Carvallo another member of the committee had died during the past year I saluted those present in the name of my North American confrères, and told them of our plans for next year The Peruvian surgeons are enthusiastic about the American College of Surgeons and the names of a number of new men were presented for approval. They were in hearty accord with next year's expedition and will be glad to welcome any of the men who decide to visit Lima

Panama

My next and last official call was at Panama City the capital of the Republic of Panama. The Panaman committee also has jurisdiction over the Canal Zone, which, properly speaking, is Panaman territory although leased in perpetuity to the United States.

I was met by Dr Runyan the secretary of our committee, who took me to the Ancon Hospital and to the Herrick Clinic with which he is associated Afterwards he conducted me to the conference which had been arranged at the Union Club

As in Lima, they entertained me at luncheon and we had a good, warm session, following the luncheon Those present were Col. Louis T Hess, Dr Alfred B Herrick Dr Troy W Earhart, Dr D F Rieder Dr Raymond W Runyan Dr William C Rucker and Dr E I Salisbury Dr Salisbury had just arrived from Venezuela the day before.

The situation in Panama is very good. There is not a large group, but including the government, the army and the navy an exceptionally strong one. They are interested and enthusiastic for the College.

General Observations

The situation of the College in South America is excellent and a splendid start has been made.

South America is an immense continent. Distances are vast and countries are of tremendous expanse In Brazil alone consider the stupendous Amazonian forest. It staggers the imagination. The forest region is almost equal to the whole of Europe. Or the Cordillera so wonderfully described by Hudson 'That world long stupendous chain its sea of Titicaca and wintry desolate Paramo where lie the ruins of Tiahuanaca older than Thebes!'

As I said at the beginning of my report this constitutes in the main the third chapter of a story of scientific and human inter-relationship, a story which is to go on into the future and to which I hope *finis* will never be written.

THE DEPARTMENT OF LITERARY RESEARCH AND THE COLLEGE LIBRARY

"A SUBSTANTIAL surgical library available to every Fellow" is the aim and immediate concern of the Department of Literary Research. The College Library must develop in such a way that it will be able to render complete service to members of the College and of the surgical profession of America wherever they may be located It must be just as useful to those who are situated in the far West, the East, and the South as to those living in the middle West,—just as useful to members in Canada and in South America as to those in the United States

To fulfill this purpose the Department of Literary Research was organized last September It is doing for the Fellows of the College what the editorial or publication department of a large clinic does for the staff of that clinic. That it is meeting a real need is shown by the number and variety of requests which are constantly being received During the past six months, a large number of research problems have been handled, many bibliographies have been prepared and brief reviews of various subjects to form the bases of shorter papers have been made. In addition many single abstracts and translations have been prepared upon request, and inquiries as to references translation of terms and the like have been answered Practically every field in general surgery and the surgical specialties has been represented in these researches until there has now accumulated in the files of the Department a large amount of material dealing not only

mology otology and rhinology In addition to the many purely scientific researches, data has also been collected to serve as the foundation for more popular addresses upon such subjects as "Cancer "The Use of Radium" The Building up of County Medical Societies" and "Choosing the Medical Profession." The Department has furnished material to surgeons in twenty eight different states and to Fellows residing in Canada It has also had opportunity to serve surgeons who are living in England and South America

Every effort is made to carry on this service as economically as possible. The work is billed at slightly less than actual cost, the College bearing a certain percentage of the expense, and as the volume of the work increases, the cost to the individual will decrease, as there will be overlapping and duplication of requests During the development of the College Library the Department has the use of the John Crerar Medical Library and, whenever necessary calls upon the Surgeon General's collection and the New York Academy of Medicine

To meet the many requests from those who desire only a little material on a subject and who do not care to have a special research made, package libraries on the more important subjects in general surgery and the surgical specialties are being developed These will be composed of reprints, clippings, and the like and will be loaned free of charge for a period of two weeks Progress is being made on these package libraries as rapidly as possible, and the Department hopes in time to have very comprehensive reference files which may be loaned in this manner Reprints, clippings, unbound journals, and any data which would be of interest in the compiling of these files will be very gladly received

The Department now has a staff of trained workers and is ready to fill promptly all requests received from Fellows of the College and members of the surgical profession of America Surgeons wishing assistance in the preparation of papers for the fall meetings and in the collecting of material for longer monographs to be published during the coming year are urged to make their requests known at an early date, so that the Department may be able to do a portion of this work during the summer months and thus fill all requests at the desired time

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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

THE SO-CALLED ESSENTIAL UNILATERAL HÆMATURIA

BY W FRANK FOWLER M D AND JULIUS L WATERMAN M D ROCHESTER NEW YORK

THE more common causes of bleeding from a single kidney are usually demonstrable Kretschmer (1) for example observed the phenomenon in seventy three cases including twenty three cases of renal tuberculosis, twelve of nephritis, eight of renal calculus eight of hyper nephroma, eight of colon bacillus infection two of renal tumor, two of polycystic disease two of trauma, two of hydronephrosis two of renal carcinoma one of pyonephrosis one of movable kidney one of doubtful stone, and one of oxaluria. In twenty-eight cases observed by Chute (2) the renal pathology was divided as follows hyper nephroma eight nephritis seven renal tuber culosis five, calculus four, hydronephrosis three and polycystic kidney one

Unilateral hæmaturia of the so-called essential type however is the subject of much conjecture Young (3) states that the first case of varicose veins of a papilla was demonstrated in 1898 Fenwick (4), in 1904 found varicosities of a papilla in six instances in which he opened the pelves of bleeding kidneys. Dowd (5) Myles (6) Kretschmer Pilcher (7), Braasch (8), Mac Gowan (9), Bunts (10), Whitney (11) Newman (12) Cabot (13) Payne and Ballenger (14), and Rytina (15) have since encountered the same condition

In this connection Payne and MacNider (16) describe the microscopic findings in three cases of nephrectomy as consisting of few if any changes in the cortex, a marked overgrowth of chronic inflammatory tissue in the medulla and pyramids which surrounded the vessels of this zone, and these vessels, in turn dilated and resembling varicosities The overgrowth of connective tissue in the papillæ and at the cortico-medullary junction interfered with the venous return thereby producing varicosities and actual hæmorrhage from the papillæ Braasch reminds us that clamping of the kidney pedicle at operation gives the appearance of varicosity and therefore the diagnosis of renal varix is not positive without microscopic confirmation

Quimby (17) examined two kidneys which had been removed because of persistent hæmaturia Macroscopically both organs appeared normal Microscopic examination showed the parenchyma to be normal but revealed hæmorrhage just beneath the epithelium of the pelvis and to a less extent in the substance of the papilla itself in both. In one there was no evidence of inflammation but vascular distention rupture, and hæmorrhage were found the latter due to mechanical rupture or injury of the thin walled vessels by some injurious circulating agent. In the other case inflammatory changes were present but there were no evidences of bacteria although they might have been present within the lesions [illegible] the tuft and the wall in the glomerule without evidences of nephritis and Gunn (19) found severe interstitial changes in an excised kidney Young states that the examination of three excised kidneys showed in one instance angioma of a papilla, in another merely congestion and in the third the evidences of chronic infectious nephritis Young observes that since bleeding re

curred twice after operation in the third case, the condition was either bilateral or was not the original cause of the hæmaturia.

Kretschmer (20) in reviewing the microscopic findings in eighty seven cases noted the frequent occurrence of nephritic changes and stated that obscure hæmaturia may be due also to infections and to changes in the blood vessels of [illegible] of small

[illegible] these ob-
[illegible] negative

Newman reminds us that we should hesitate to make a diagnosis of essential hæmaturia since careful search may reveal a few discrete lesions of a glomerulo-nephritis. And Schuller (21) states that there are practically always either gross or microscopic lesions in these bleeding kidneys.

Young and Walther (22) also believe that idiopathic hæmaturia is very rare. Morris (23) however reported three instances in which, after nephrectomy no lesion could be demonstrated. Kretschmer reported two negative microscopic findings in twenty-seven cases and MacGowan, Levy (24) and Braasch each found no pathology in one instance. Ross (25) also observes that sometimes sections do not show the cause of the bleeding.

Rytina enumerates the causes to which obscure hæmaturia has been attributed as follows: (1) passive congestion (2) patchy or diffuse fibrosis of the kidney (3) chronic papillitis, (4) varicose papillæ, (5) nervous vasomotor reflexes without anatomical lesions, (6) glomerular nephritis (7) bacillus coli communis infection, and (8) localized nephritis. Braasch concludes that the unexplained hæmaturias are due probably to chronic insidious infections confined around the papillæ.

The frequency of nephritic change has been noted by many observers. Kretschmer for example, records the discovery of such changes in seventy five of eighty nine microscopic examinations. Bunts observes that operation revealed unsuspected nephritis in eleven cases and Squier (26) states that the usual findings are those of a glomerulo-nephritis due probably to a chronic focal infection elsewhere in the body. Rytina believes that localized nephritis without the usual nephritis signs is probably the most frequent cause of obscure hæmaturia.

Ross observes that microscopic examination of kidneys removed for essential hæmaturia often reveals evidences of interstitial nephritis although the clinical signs and symptoms of nephritis are lacking. Dowd reported a case of painless hæmaturia of five years' duration in which no abnormality was found when the pelvis of the kidney was opened. The bleeding stopped. Later albumin and hyaline casts appeared in the urine. Apparently the bleeding had been due to a chronic nephritis which had not been manifest before.

Walther (27) reported an instance in which following nephrectomy to save life, microscopic [illegible]

chronic passive congestion is an important etiological factor in obscure renal hæmorrhage.

Renal calculi, tuberculosis, and tumors must be differentiated from the so-called essential hæmaturia because according to Newman they may be painless and, as Kretschmer states, they may often occasion profuse urinary hæmorrhage. Newman observes that these conditions and unilateral nephritis also are demonstrable by our usual diagnostic aids, the X ray bacteriologic and microscopic examinations of the urine and cystoscopy.

On the other hand, Ross found evidences of [illegible]

obscure renal hæmorrhage, and Bunts observes that operation revealed nephritis in eleven cases undiagnosed before operation.

Regarding the differentiation from essential hæmorrhage Braasch states that in chronic nephritis the hæmaturia is scanty and other symptoms of nephritis are present. Infectious nephritis is indicated by the presence in the urine of pu[illegible]nd bact[illegible]n
quen
Such
marked by dull persistent pain whereas the pain of essential hæmaturia is caused only by a blood clot. The pus cells in pyelitis are few and pyelography shows irregularity of the renal pelvis. In renal tuberculosis hæmaturia is occasionally the only early symptom. Guinea-pig inoculation may clear up the difficult differentiation from essential hæmaturia. Braasch reminds us further that small stones may be negative to the X ray and that the diagnosis of renal varix may depend upon the microscope.

The problem of differentiation between bleeding due to renal neoplasm and hæmorrhage of the

essential type demands thoughtful consideration Essential hæmaturia is rare and Squier observes that renal tumors also are unusual Both may be characterized merely by bleeding

In this connection Ross states that hæmaturia is the primary symptom of malignant kidney neoplasms in 36 per cent of the cases and the only symptom in 12 per cent. Barney (30) observed bleeding as the first symptom in eighteen of seventy four cases and Willan (31) witnessed the same phenomenon in fourteen of fifty two instances. Israel (32) noted hæmaturia as the initial symptom of hypernephroma in 70 per cent of sixty-six cases, and Denaclara (33) states that hæmaturia is very often an early, or the only, symptom of renal neoplasm Hinman (34), in reviewing the statistics of eight surgeons discovered that hæmaturia was the onset symptom in 301 of 709 cases

The insidious onset of hypernephroma is illustrated by a case reported by Hinman in which death occurred seven months after the first and only attack of bleeding In this instance a primary pyelogram was not made although the ureters were catheterized After one experience of instrumentation the patient refused further examination Hinman states that deformity of the renal pelvis is the most positive urological evidence of tumor although the diagnosis must rest, of course, upon a correlation of the clinical and the urological findings. Ross observes that as a rule renal tumor occurs in persons over 40 years of age pain is slight, but hæmorrhage is frequent and severe. Ordinarily there is no frequency of urination or pyuria. There is absence of fever and sweat, and the loss of weight and of appetite progresses slowly The tumor is marked and can be easily outlined by the X ray The finding of fragments of tumor and atypical cells in the urine makes the diagnosis of renal tumor comparatively positive.

Braasch (35) informs us that the hæmaturia of renal neoplasm usually lasts but a day or two and occurs at short and irregular intervals, whereas bleeding which is prolonged over several weeks or months with recurrences at long intervals suggests nephritic or essential hæmaturia. Differentiation is difficult if the tumor cannot be palpated. Pyelography reveals deformity in over two-thirds of the cases coming to operation, but early tumor may not show pelvic irregularity

A tumor advanced enough to cause hæmaturia, however, would probably show deformity with pyelography but considerable variation in the pelvic outline is necessary to distinguish the normal from the abnormal. Of twenty two cases with operation in which pyelography was employed recognizable deformity was demonstrated in seventeen. Profuse hæmaturia is a grave symptom and should be considered a symptom of malignancy until it can be proved otherwise. "Even after all possible clinical evidence has been obtained, the question will often be raised whether or not operation is indicated Tumor of the kidney was discovered at operation in two cases in which the clinical evidence rather suggested essential hæmaturia. '

In this connection Braasch cites the case of a man aged 50 years who had had hæmaturia for three months with a weight loss of 15 lb There was neither tumor nor pain Cystoscopy disclosed the right kidney as the source of the bleeding but examination was otherwise negative. At operation the kidney appeared of normal size and form but after nephrectomy microscopic examination revealed hypernephroma. Rytina states that a beginning neoplasm may [illegible] hæmaturia ential type Braasch makes the important observation that varicocele in a man 40 years of age or over which is recent origin and associated with unexplained hæmaturia is very suggestive of hypernephroma

The differentiation is further complicated by the fact that essential hæmaturia sometimes induces pain. Bunts for example, observed this phenomenon in thirty-six of seventy cases. However as it is due to the passage of blood clots through the ureter it usually simulates renal colic rather than the pain due to a neoplasm.

The early diagnosis of renal tumor is exceptional since Hinman found that although hæmaturia was the onset symptom in 47 per cent of 709 cases, only 6 6 per cent showed hæmaturia without pain or tumor at the time of operation Braasch, in reviewing eighty three cases of hypernephroma, discovered that 77 per cent of these patients had observed hæmaturia for more than a year before other symptoms necessitated treatment. Of these eighty three cases which came to operation the kidney was irremovable in twenty two Of sixty-one patients in this series who were subjected to nephrectomy seven died in the hospital and twenty seven succumbed later One case in five is clinically considered inoperable.

Young on the other hand, stresses the fact that renal tumors can usually be diagnosed before operation and reminds us that malignant disease is rarely if ever discovered by exploration Braasch warns us that operation is not warranted by only one or two attacks of hæmaturia.

investigation

The report of a case in which such examination was made, although merely confirmatory seems amply justified since the condition remains a *diagnostic mystery*

The subject of this report was a man aged 46 years, who had always been well except that he had had pneumonia about one year ago Two months ago he fell,

renal colic was concurred in

followed by a gush of urine The catheter could not be passed more than ¾ inch beyond the meatus even after several attempts Phenolsulphonephthalein injected

the sodium bromide solution filling the pelvis of the left kidney and the two lower calices

The diagnoses suggested to one of us (Wiesman) were (1) hypernephroma, (2) tuberculosis, (3) hematoma following the injury of the previous month and (4) stone The latter was not shown by the X ray The absence of ulceration and other bladder disturbances was against tuberculosis The diminished excretion of phthalein on

to be considered

The blood count showed 2,400 leucocytes and 72 per cent polymorphonuclears The blood Wassermann was negative

The examination of a single specimen of clear urine upon admission to the hospital prior to the urological investigation revealed merely the presence of a few pus and blood cells This urine represented the output from the left kidney only as the right ureter was still completely

apparent cause

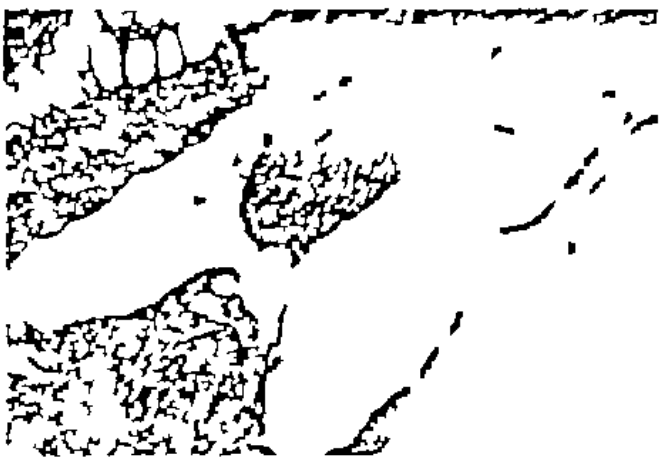


Fig 1 Greatly dilated interlobar vein In an adjoining field there is much blood beneath the pelvic mucosa Cellular infiltration, which is marked in nearby fields, is only scattering here

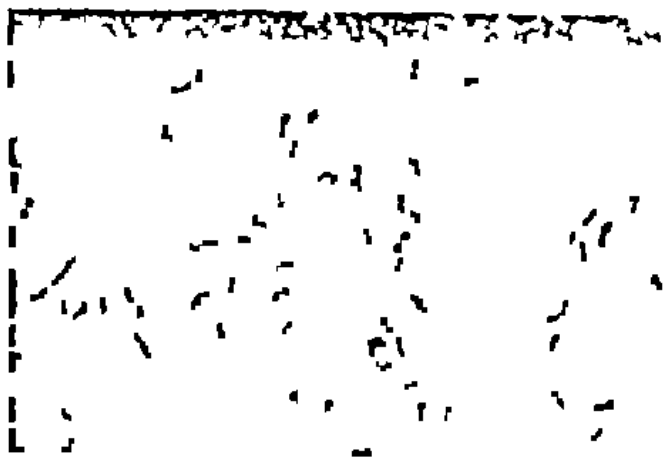


Fig 2 Widely dilated venous channel at cortico medullary junction

Seven months after nephrectomy intense pain, fever

due probably to the presence of the non-absorbable material.

The mucosa of in places has which cannot

be wiped off easily

polymorphonuclear and endothelial cells. In the former location this is mostly in sharply circumscribed focal areas two or three times the diameter of a tubule. The tubules and glomeruli are negative throughout.

The pathological diagnosis was submucosal hemorrhage in pelvis varix of renal venules focal infective nephritis early arteriosclerosis.

Regarding treatment Levy states that nephrectomy is the only operation ever indicated and then only as an emergency measure to save life that non-operative measures such as the intrapelvic injection of silver nitrate and adrenalin the passage of a ureteral catheter, the oral administration of calcium lactate, and the subcutaneous or intramuscular injection of horse serum have proved effectual, although it is unsafe to predict cures as recurrences are common, sometimes developing even after long intervals (eighteen recurrences in a series of thirty cases) Levy states further that the bleeding in essential hæmaturia often ceases spontaneously that the general health is usually not affected by the loss of blood, that none of the carefully observed thirty cases developed subsequent serious kidney disease, and that the prognosis is favorable in spite of the recurrences and the loss of blood

SUMMARY

1 Clinically the so-called essential hæmaturia is rare and microscopically it is rarer still since only occasionally does thorough examination of the excised kidney prove negative

2 The apparent efficacy of various measures both surgical and non surgical, in the treatment of essential hæmaturia may be due to the fact that the bleeding often ceases spontaneously

3 Between the cases considered idiopathic clinically and those proved idiopathic by the microscope lies a group including varicosities of the papillæ and early hypernephromata

4 In view of the difficulties attendant upon the early diagnosis of renal malignancy unilateral hæmaturia should be considered of malignant origin until proved otherwise

5 The writers suggest the term obscure hæmaturia in preference to the term essential hæmaturia

The writers acknowledge their indebtedness to Dr R R Mellon Director of Laboratories, and Dr W S Hastings, Tissue Pathologist, of the Highland Hospital for their co-operation in the preparation of this paper

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Pickerill H P and White, J R.: The Tube Skin Flap in Plastic Surgery *Brit J Surg.*, 1922 xi 321

The recent war led to many changes in the management of surgical lesions especially in plastic surgery The tube skin flap was first used extensively at Queen s Hospital Sidcup Pickerill who was on the staff of Queen s Hospital, describes and discusses the methods employed The purpose of the formation of a tube flap in plastic facial surgery is to convey tissue to the face from the chest neck scalp or forehead in a viable state. The flap is almost sure to retain its vitality and its use reduces scarring of the face to the minimum Such flaps lend themselves to what Pickerill terms caterpillar grafting which is of particular value when the tissue must be obtained from areas without large blood vessels.

The tube graft is an extension of the idea of the [illegible] astic work [illegible] uble tube the nose, [illegible] ethods of applying the principles learned of plastic surgery of the face to plastic work in general surgery The failure of chronic ulcers to heal is due to fibrosis in the deeper layers White describes a method of dealing with such cases which gives very satisfactory results M. R. Flynn M D

ANÆSTHESIA

Groenberg J : Studies of Blood Ferments in Men [illegible]

The author studied the effects of ether chloroform, carbolic acid, lysol, veronal morphine and lead on the blood ferments by Abderhalden s dialysis To determine the effects of ether and chloroform, the serum of young and healthy patients operated on for surgical lesions acquired in the war or for hernia, and the serum of rabbits and dogs was tested during and after the narcosis with substrata of various organs In acute poisoning the test was made only once, but in chronic poisonings it was tested twice at an interval of two to four weeks At the same time for purposes of control, parallel tests were made with the same substrata with sera from normal persons

The tests showed that almost all sera of men and animals subjected to the effects of ether chloroform, carbolic acid lysol, veronal, morphine or maternal containing lead contain Abderhalden s prophylactic ferments reacting to brain and nerve substance When ether was used the reactions of serum and lung were more frequently positive than when chloroform was employed In acute poisoning with carbolic acid or lysol substrata of liver and kidney in particular were attacked, while the serum of patients poisoned with veronal reacted only to liver In chronic morphinism and lead poisoning the result was t[illegible]
the liv[illegible]
to be
respect to the thyroid

Before the narcosis from ether or chloroform the sera of all the individuals tested showed a negative reaction with respect to all the substrata tried out, but during the narcosis the reaction was positive with regard to certain substrata Further sera taken from cases of acute or chronic poisoning showed a positive Abderhalden reaction with regard to certain substrata, while the sera of normal individuals, tested at the same time, showed a negative reaction to the same substrata.

From this research the impression is gained that substances with pronounced toxic qualities besides causing the clinical symptoms which can be demonstrated objectively in the usual examination of the patient affect the blood in such a manner as to cause the formation of ferments which are not present in the blood of normal individuals If all the precautions mentioned by Abderhalden are taken and the reactions are judged with great care one comes to the conclusion that in spite of its defects in the present stage of its development dialysis gives typical results which speak in favor of the correctness of Abderhalden's ideas regarding prophylactic ferments

Details of the tests and case histories are given in the article. Koritzinsky (Z)

Gwa[illegible]

Gwathmey discusses the synergistic action of magnesium sulphate with other anæsthetics and describes in detail experiments on animals

Clinically h[illegible]
morphine and
drugs were e[illegible]
and novocaine in twenty-one cases, ether in one

case nitrous oxide-oxygen and ether in eight cases, nitrous oxide-oxygen and novocaine in four cases, and novocaine alone in five cases The technique employed is described The authors conclusions are as follows

1 Magnesium sulphate may be combined with nitrous oxide or ether for anesthesia to the advantage of both

2 The synergistic action of the magnesium sulphate decreases by about one half the amount of nitrous oxide or ether necessary for anesthesia

3 Morphine magnesium sulphate and nitrous oxide-oxygen give more relaxation than morphine and nitrous oxide-oxygen and frequently as much as morphine, nitrous oxide oxygen and ether

4 With the technique described a very satisfactory anesthesia may be induced with reduction or elimination of postoperative nausea vomiting pain distention pneumonia, and shock

ISABELLA C HERR, M D

McCurdy J R.: Rebreathing and Etherization Int J Surg 1922 xxxv Anes Supp

McCurdy discusses particularly the advantages of rebreathing during etherization He is of the opinion that they depend upon the tension or relative volume of carbon dioxide in the blood and tissues during anesthesia Any amount of re

the amount of exhalation permitted to escape and *the amount of ether vapor added to the inspired air* Another very important element which enters into this control to a greater or lesser extent in every

a relative diminution in the oxygen content of the blood Other factors to be considered are the heat, moisture, and waste products of metabolism other than carbon dioxide in the expired air

For the past seven years the author has been using a mixture of 10 per cent carbon dioxide and 90 per cent oxygen in all conditions of depressed respiration and circulation during ether anesthesia This causes an increased respiratory rate and vol

Webster W A Consideration of Ethyl-Chloride Anesthesia. Int J Surg 1922 xxxvi Anes Supp 0

Webster discusses the chemistry of ethyl-chloride anesthesia, its physiological effects, scope and utility the method by which it is induced its after-effects and it mortality

In regard to safety which must always be the chief consideration in the use of any anesthetic he states that nitrous oxide is undoubtedly better than *ethyl chloride It lack the portability of ethyl* chloride however and unless it is administered with oxygen continuously the duration of the anesthesia is not so great as when ethyl chloride is used.

If necessary the dose of ethyl chloride may be repeated several times In certain dental cases requiring a large number of difficult extractions two and even three capsules may be used In such cases the recovery period is somewhat more prolonged and the tendency to nausea is increased but not nearly to the same extent a when chloroform or ether is used for the same length of time

ISABELLA C HERR, M.D

Guedel, A E Ethyl-Chloride General Anesthesia: A Classification of Signs of Overdose and Its Action on the Cardiovascular System Int J Surg 1922 xxxvi No Supp 14

Guedel s report is based upon personal observations made during the past five years in the use of ethyl chloride for general anesthesia in about 2,000 cases. Most of the operations consumed from one to five minutes but about 200 required from fifteen minutes to one hour In nineteen cases carefully studied the average time of operation was fifty *three minutes*

Most of the author s observations were made upon wounded soldiers in good physical condition

Ethyl chloride in overdose produces one of two types of symptoms the spasm type and the respiratory depression type

Approximately nine out of ten patients overdosed with ethyl chloride manifest the spasm type of symptoms

The first indication of approaching spasm is a sardonic grin due to contraction of the muscles about the mouth About the same time there i

If the overdose of the drug is continued, the spasm *progresses rapidly until*, in about one or one and a half minutes, it completely obstructs respiration and causes peripheral asphyxia.

When the masseteric spasm is well developed it is practically impossible to pry the jaws apart sufficiently to insert a mouth gag

When the general spasm is well developed, all of the muscles of the body are somewhat rigid but chiefly the muscles of the face, mouth pharynx, and larynx. The respiratory effort is violent

Once inaugurated, the spasm develops so rapidly that cyanosis usually does not appear until the obstruction is almost total It then develops very rapidly and in about half a minute the patient is black.

The rapidity of progress of the spasm is apparently in proportion to the vapor tension of the ethyl chloride.

thesia and consciousness is so narrow and the stage of overdose so close to the operative state that it is difficult to maintain anæsthesia without frequently causing the beginning of this spasm

With knowledge of this action there is ample warning from the beginning spasm to avoid its more serious aspects by the immediate removal of the drug

The beginner in the use of ethyl chloride should always insert a mouth gag before starting the anæsthesia.

The depression type of symptoms of overdosage of ethyl chloride is a progressive central respiratory depression and occurs in approximately one of ten cases in which an overdose is given. From the onset, the respiratory effort grows less both in volume and in rate The depression in volume is greater than that of the rate With the continuance of the drug in overdose this depression progresses to a complete respiratory paralysis in from one-half to two minutes depending upon the patient's resistance and the vapor tension of the drug The patient is entirely relaxed.

The picture during the deeper degrees of depression is one of collapse. The color is ashen, the

slowed, is of good quality and regular In fact, it seems to be affected in rate only, and in cases of light depression is not affected at all. Clinically in many cases of this depression the author has not found any change in the pulse other than a moderate slowing The greatest fall in pulse rate observed by him was from 100 to 50 in a period of five minutes during one minute of which there was no respiratory effort whatever

The slowing pulse rate begins with the slowing of the respiration and progresses with the respiratory depression.

Like the spasm this respiratory depression may be repeated during the same anæsthesia as often as the patient is overdosed Following recovery the anæsthesia may be continued as usual.

During the depression there is a progressive secondary dilatation of the pupils. This does not occur in spasm.

To the observant anæsthetist there is ample warning of the approach of the depression Therefore total paralysis of the center can be avoided. If it occurs, however resuscitation is simple. As there is no respiratory obstruction two or three forceful manual compressions of the thorax serve to eliminate the excess of the drug from the respiratory center and automatic respiration is re-established to carry itself to the anæsthetic normal in from one to four minutes

The first stage of dilatation of the pupils is more marked than that caused by any other anæsthetic. Early dilatation is of no importance Dilatation of the pupil after anæsthesia is well begun occurs only in cases of overdose causing respiratory depression

It is impossible to pre-determine the type of symptoms that will be produced by overdosage in a given case but when a type is once manifested, it remains constant throughout the anæsthesia. The author has seen only one case which manifested both the spasm and the depression types during the same anæsthesia, and in this instance neither of the syndromes was typical. ISABELLA C HERB, M.D

Boyle, H. E.: Gas-Oxygen Ethanesal-Chloroform Combined Anæsthesia for Nose and Throat and Abdominal Surgery *Am J Surg* 1922 xxxvi Anæs. Supp 17

Boyle discusses ethanesal, a new anæsthetic agent which has been prepared recently by Wallis and Hewer Wallis has found that an absolutely pure ether will not produce anæsthesia that it is merely a vehicle to convey the true complex anæsthetic Ethanesal is a compound of ketone in which carbon dioxide and other gases are united. This ketone complex is dissolved in pure ether to the extent of from 2 to 5 per cent

The purification of the ether a necessary preliminary is carried out in two stages (1) the oxidation of aldehydes and mercaptans by finely divided permanganate and (2) the removal of acids, peroxides and water by means of anhydrous copper sulphate By distillation in a special condenser a

1 It is anæsthetic only in very large quantities.

2 It is a cerebral excitant When the ketone is added to this pure ether its properties change at once

3 It is a safe and reliable anæsthetic.

4 Its action on the circulatory system lies between that of chloroform and that of ether

5 It causes none of the irritating effects usually produced by ordinary anæsthetic ethers.

6 By means of it analgesia can be maintained for a prolonged period

and does not aggravate these conditions when they are present.

9 In animals it is without effect on the blood pressure or respiration

The agent responsible for the anæsthetic action is the ketone complex This is non-toxic in the

present even in the very poor samples of ordinary ether On the other hand, some of the higher grades of anæsthetic ether have very little anæsthetic action because of a deficiency in their ketone complex. ISABELLA C. HERB M D

Farr, R. E.: Infiltration and Infiltration Block vs. Regional Anæsthesia in Abdominal Work. *N York State J M* 1922, xxii, 40

Simplicity speed, accuracy and minimal disturbance of the patient are the important elements in the induction of local anæsthesia in abdominal surgery Direct infiltration and infiltration-block possess these attributes to a much higher degree

the method properly

Direct infiltration with the pneumatic injector makes it possible to establish anæsthesia with the minimum of discomfort to the patient By this method the solution may be disseminated throughout the area of the incision in less than three minutes in any case and immediate and complete anæsthesia obtained in nearly every instance

In the pelvis the more simple work is preceded by a blocking of the round ligaments and ovarian pedicles. More extensive operations, such as uncomplicated hysterectomies, may be performed under

ISABELLA C. HERB, M.D

Bulson A. E., Jr.: Butyn a New Synthetic Local Anæsthetic: Report Concerning Its Clinical Use—Special Report of the Committee on Local Anæsthesia of the Section on Ophthalmology of the American Medical Association *J Am M Ass* 1922 lxxviii 343

increased.

For operative work the committee has followed the plan generally used when cocaine is the anæsthetic employed four instillations are given three

up to the present time has not been performed under butyn anæsthesia by any member of the committee

for nearly an hour

disease has passed.

The committee is unanimous in the opinion that for purely surface anæsthesia for minor operations

obtain butyn anæsthesia is the same as that

usually employed to induce cocaine anæsthesia. The use of a 2 per cent solution of butyn results in a more profound anæsthesia than that obtained with a 4 per cent solution of cocaine and has no objectionable effects. For operations on the extrinsic muscles of the eyeball the results are equal to those obtained with cocaine, but the committee believes that a solution stronger than a 2 per cent solution may be preferable.

As butyn produces no ischæmic effects there is no shrinking of tissues following its use hence the condition of the intranasal tissues remains approximately unchanged This is of importance when a portion or all of a turbinate is to be removed When combined with epinephrin butyn in 5 per cent solution ill of the maj submucous and intranasal operations on the accessory sinuses Not only is the anæsthesia very satisfactory but up to the present time not the slightest toxic effects have been noted in the hundreds of operative cases in which the anæsthetic has been used.

The committee now has a detailed record of clinical experiences with butyn in several hundred major operations on the eye, the nose, and the throat These include cataract extraction iridectomy (including that done for the relief of glaucoma) trephine operations magnet extraction of foreign bodies tenotomy and advancement of the ocular muscles pterygium operations the removal of cysts and other tumors from the eyeball or lids grattage and a few cases of plastic surgery of the lids, including the correction of entropion and ectropion

Local anæsthesia is tested best when used for operations which involve cutting of the iris or intrinsic muscles of the eyeball. December 1 the committee had a record of thirty nine cataract extractions combined with iridectomy twenty three iridectomies performed for glaucoma or as operations preliminary to cataract extraction, twenty-one capsulotomies and iridectomies and eight muscle advancements all done satisfactorily under butyn anæsthesia

Butyn anæsthesia has been used in practically all of the major intranasal operations, including submucous resection of the septum, turbinotomies

The results of the clinical and experimental use of butyn seem to justify the following conclusions

1 Butyn is more powerful than cocaine and therefore a smaller quantity is required

2 It acts more rapidly than cocaine

3 Its action is more prolonged than that of cocaine

4 According to experience to date butyn in the quantity required is less toxic than cocaine

5 It produces no drying effect on the tissues

6 It produces no change in the size of the pupil

7 It has no ischæmic effect and therefore does not cause shrinking of the tissues

8 It can be boiled without impairing its anæsthetic efficiency ISABELLA C. HERB M.D

SURGERY OF THE HEAD AND NECK

HEAD

Cutler E. C.: The Relation of the Hypophysis to Antibody Production *J Exper M* 1923 xxxv 243.

The important part that many of the endocrine organs play in development and function suggests the possibility that they may enter also into the mechanism of resistance to infection. Up to the present time there is little positive evidence that such is the case. It was felt however that a study of the more inaccessible glands of internal secretion whose function in relation to immunity had not been investigated might yield valuable information Hence a study of the pituitary gland was made as part of a general investigation into this field.

The guinea pig was selected as the experimental animal because its reactions had already been standardized in Immunological studies An operative technique
tomy
hæmag

These studies were run in the following series Series 1 the production of antibodies after hypophysectomy Series 2 the effect of hypophysectomy on antibody production and Series 3 the effect of feeding and injecting pituitary extract on the production of antibodies A detailed description of the operative technique and the serum reactions is given, and the experimental findings are recorded. The results of the study are summarized as follows

Guinea pigs immunized to bacillus typhosus produced specific agglutinins in the same quantity and at the same rate as guinea pigs not operated upon and as operative controls immunized at the same time and by the same method

In guinea pigs previously immunized to bacillus typhosus and red blood corpuscles of the hen partial hypophysectomy had no effect on the continued production and persistence of typhoid agglutinins hæmagglutinins and hæmolysins

In guinea pigs immunized to bacillus typhosus, both the continued ingestion and the intraperitoneal injection of the whole pituitary gland extract had no effect on the subsequent agglutinin titers as compared with those of normal animals.

The experiments appear to show either that the hypophysis does not play an important direct or indirect part in the production of and persistence in the blood of typhoid agglutinins hæmagglutinins,

[illegible]

Apollon Harutoro M D

[illegible] Subcranial and Cervical Abscesses

This is a comprehensive work in the form of a monograph The mode of infection general diseases (tuberculosis diabetes, etc) fractures of the [illegible]

[illegible]

tion of fistula. Further progress into the soft parts at the base of the skull and the neck usually occurs—except in very severe infections—along definite anatomical routes, the spaces formed by muscles and aponeuroses There are (1) the suboccipital [illegible]

at the anterior wall of the vertebral column, which continues into the posterior mediastinum (4) the prestyloid space, between the wall of the pharynx, the descending ramus of the lower jaw and the pterygoid muscles and (5) the previsceral space, between the trachea and the muscles of the hyoid bone which is continuous below with the anterior mediastinum

The subcranial abscesses originating in the ear are of the following topographical and anatomical types

1 Subcutaneous abscesses

2 Abscesses of the sternocleidomastoid muscle and its sheath following perforation of the tip of the mastoid process

3 Bezold's abscesses, deep abscesses of the sternocleidomastoid region which not infrequently are associated with other abscesses or involve other spaces They advance toward the trapezius or the deep musculature of the nape of the neck, along the occipital artery or medially along the digastric muscle to the large vessels. In rare instances they enter the retropharyngeal or retrovisceral spaces

4. Abscesses between the posterior belly of the digastric muscle and the large vessels (Mouret's type) medial to Bezold's abscesses These arise [illegible]

[illegible]

may arise also indirectly from thrombosis of the lateral sinus

6 [illegible]

culati
in va
phleb
mastoid emissaries In rare cases these abscesses may perforate through the occipital bone into the cranial cavity

7 Retropharyngeal and parapharyngeal abscesses, the former in the retropharyngeal space the latter in the prestyloid space in front of the cervicofacial diaphragm

8 Anterior and posterior mediastinitis, which arises by continuity from the abscesses already mentioned

The prognosis depends on the type of infection [illegible]

[illegible]

Eagleton, W P: The Operative Treatment of [illegible]

[illegible]

The number of cures of general suppurative [illegible]

fatal.

The fundamental facts that suppurative meningitis is primarily a disease of the cerebrospinal fluid system—a circulatory system which, while intimately associated with the cerebral tissue and the blood circulatory system, is distinct from them—and that the cerebral tissue is involved only secondarily are of prime importance in approaching the subject from the surgical standpoint

The misconception that a fair proportion of recoveries from general suppurative meningitis of local origin have followed operation had its origin in the failure to appreciate the diagnostic and pathologic distinction between a lumbar puncture which reveals a cloudy fluid filled with leucocytes but without bacteria, indicating a protective and reparative process and the puncture which yields a turbid or a clear fluid containing microorganisms and indicating a general suppurative meningitis

Consequently a considerable number of the cases of *suppurative meningitis* reported cured were in reality cases of protective meningitis and while clinically they presented severe meningeal symp-

toms the general cerebrospinal fluid system was not invaded by bacteria

In a review of the literature the author collected thirty-one reports of cured cases In the reported cases of cure from meningitis of blood-stream origin—five cases of pneumococcus meningitis—the successful treatment undoubtedly was the intra spinous injection of a serum which controlled the bacterial invasion of the meninges and probably stimulated the protective meningeal mechanism The elimination of the blood-stream infection by the action of the blood alone or with the assist ance of a serum or vaccine acting upon the circulat ing blood plays but a secondary part Proving this is the immense number of spontaneous cures of pneumococcus blood stream infection as compared with the almost constantly fatal result when the meninges become involved by the bacteria Microscopic evidence warrants the belief that 25 per cent of all general pneumococcic invasions are associated with a protective meningeal reaction

Of the twenty-one cases of general suppurative meningitis of local origin which were reported cured over two-thirds or from fifteen to seventeen cases had had, prior to the general meningeal infection, a meningeal protective reaction which was in effect at the time of the general meningeal invasion The invasion of the cerebrospinal circulatory system was possibly a temporary breaking loose of micro-organisms through the limiting process

On account of the relatively large proportion of cures in all the cases of local origin it is reasonable to assume that recovery was due largely to the presence and immediate action of this protective process assisted by the evacuation of the causative localized intra-dural suppuration (I e brain abscess

which might have been associated with a pachy meningitis interna such as extra-dural abscess sinus thrombosis or adjacent caries of the bone

If this deduction is correct, it is of prime impor tance in the treatment of general suppurative meningitis for the surgeon to direct his efforts to stimulating and assisting the protective meningeal mechanism
as is now
this can b
cerebrospin
irrigations. The technique is described in detail

In the small number of recovered cases of local origin in which apparently there was no protective process in operation—five in all—the curative agents were so diversified that they may be regarded as more or less accidental

Lumbar puncture alone is undoubtedly of therapeutic value. Probably because it is the means of removing some of the infected fluid, and possibly by keeping open the cerebrospinal pathways it temporarily relieves the cerebral compression which favors intra-cerebral and meningeal suppuration.

The number of cases in which a cure has been effected by the intrathecal injection of serum either alone or in conjunction with other measures is too large to be ignored It suggests that the intra spinous intra ventricular or cerebro-subarachnoid injection of a serum, even if it possesses no specific action on the particular type of infecting organism, undoubtedly has a therapeutic value probably be cause it stimulates a protective meningeal reaction to the foreign protein.

As a result of his analysis the author concludes that if bacteria are free in the cerebrospinal fluid circulatory system in the presence of a localized focus of suppuration within or involving the dura drainage of the intra-dural focus of infection with lumbar puncture offers a slight chance of recovery In the absence of such an intra-dural suppuration, stimulation by a serum injected into the spinal or cerebral spaces of the cerebrospinal system offers a slight prospect of recovery Logically however subarachnoid lavage holds out in all cases a prospect not offered by any other therapeutic measure as it alone keeps the cerebrospinal system of pathways open. C Coubin Yancey M D

Meyer A. W A Method to Discover Brain Tu mors at Trephination by Measuring the Elec trical Resistance (Methode zum Auffinden von Hirntumoren bei der Trepanation durch elek trische Widerstandsmessung) *Zentralbl f Chir* 1921 xlvii, 1824

The localization of tumors of the brain has here tofore presented considerable difficulty Puncture palpation, percussion of the skull, etc. the means used up to the present time have often given un satisfactory results On the assumption that the brain mass because it is more fatty would have a greater electrical resistance than a brain tumor blood, or fluid Meyer examined its electrical con ductivity in cadavers and animals. The expected differences were found and were in fact so great that tumor resistance could be confused at most only with blood resistance Since this is of no practical importance—one would not be apt to make the mistake of inserting both electrodes into one brain sinus—the measurement of the electrical conduct ivity will give valuable aid in the localization of brain tumors.

A fine aseptic bipolar electrode is inserted into the brain in various directions The method was found to be of practical value in the first case in which it was used Wrede (Z)

Hultén O : The Development of the Falx Cerebri and the Tentorium Cerebelli Considered in Consequence of a Case of Malformation (Ueber die Entwicklung der Falx cerebri und des Tentorium cerebelli im Anschluss an einen Fall von Missbildung derselben) *Upsala Lackaref Forh* 1921 xxvi 18.

The falx and tentorium are developed by plastic modeling of the connective tissue during the growth

of the brain. Because of the arrangement and branching of the vessels (the two anterior cerebral arteries between the cerebral vesicles and the posterior cerebral and superior cerebellar arteries between the cerebrum and cerebellum) this connective tissue is divided into a non-vascular middle zone and two vascular lateral zones. The middle layer attains in its further course a functional connection with the skull, while the vascular lateral layers attain, by the ramifications of their vessels into the brain mass, an intimate correlation with the brain. The pulsations of the brain finally cause a splitting of the three layers. The cleft then becomes the subdural space, the non vascular middle layer becomes the falx or tentorium and the vascular lateral layers become the soft cerebral membranes.

The structures of falx and tentorium are distinctly suited to their function of reinforcing the skull: the tentorium has an upper fibrous layer

defect of the falx and malformation of the tentorium in a 70-year-old woman. This condition he attributes to a primary vascular anomaly in the region of the anterior cerebral artery. WARNER (Z)

Hesser, C., and Troell A.: The Problem of Cerebellar Localization (Zur Diskussion ueber das cerebellare Lokalisationsproblem) *Upsala Lakaref Forh.* 9 XXVI, 80

Chiefly through the work of Bolk, the Lucianl doctrine of the functional homogeneity of the cerebellum has been replaced by the view that the cortex of the cerebellum shows a functional localization. It is believed by many that the cortex contains a large number of well-demarcated interdependent centers. The view is held also that each set of muscles working together and grouped according to direction of movement has its limited and separate area of projection on the cortical surface.

On the basis of their own animal experiments the authors have come to the conclusion that muscle groups which carry out a definite movement together are represented by an interaction of cells or cell groups distributed over regions of the cerebellar cortex of greater or less size, but are not confined to these alone being mingled with the cell groups

cortex may be considered a sensory (receptive) nerve substance. The findings of research on the anatomy of the fibers of the cerebellum agree very well with this theory.

Regarding the general function of the cerebellar cortex the authors point out that in their animal experiments, severe complicated cerebellar disturbances were to be ascribed less to an injury of *the gray cortical substance alone than to a simultaneous injury* of the paths of association below the cortex. WARNER (Z)

Horsley J. S. The Surgical Treatment of Extensive Basal-Cell Carcinoma. *J. Am. M. Ass.* 1922 lxxviii, 412

Cancers of the skin are of the basal-cell and the spinous-cell types. The basal-cell cancer is usually *less malignant than the spinous-cell cancer. It does* not metastasize but extend by th continuity or contiguity of tissue. Even though it may occupy

"pearls" are rarely cured even by *the most thorough* resection.

It is apparently useless to treat basal-cell cancer with the knife as the resistance of the neighboring tissue is lowered and the cancer cells are transplanted into the new raw surface. To prevent transplantation the surface of the cancer must be destroyed and sealed by cauterization. The excision must be done as far as possible by means of the actual cautery and the raw surface covered with tissue from a distance which still retains its normal resistance to the cancer cells.

The following cases are reported.

CASE 1. The patient was a man 49 years of age who had had a small ulcer on the left side of the upper lip for two years. At operation under ether the pharynx was packed with gauze and the anesthesia continued by means of a tube introduced into the upper part o the trachea. The cancer which extended over most of the nose and the upper alveolar process, was cauterized with the Percy cautery the mass of tissue was excised down to the bone by means of a sharp electric cautery and the bone was removed. A skin flap was then outlined on the left side of the face with its base near the lower jaw and its body over the left pectoral region. The pedicle of the flap was dissected up and its

edges were brought together with a continuous suture of catgut according to the method of Gillies. After some minor plastic work complete healing occurred and there has been no recurrence after a period of eighteen months

CASE 2 The patient was a woman 55 years old who for many years had had a lesion involving the right cheek, the right upper lip, and the nose. At operation the trachea was opened and the anæsthesia continued through a tracheal tube The cancerous area was thoroughly cooked with the Percy cautery and removed with a sharp electric cautery One skin flap was outlined on the forehead and another from below and then sutured in place as in Case 1 A minor recurrence beneath the right eyelid and another at the stump of the alveolar process have been cauterized The patient is still under observation Both recurrences developed where the transplanted flap had not grown.

The author draws the conclusion that it is important to apply the raw surface of a pedunculated flap from a distance as soon as possible to the raw surface from which the cancer has been excised

WILLIAM J PICKETT M.D

NECK

Pemberton J deJ : The Surgical Treatment of Toxic Goiters. *Boston M & S J* 1922 clxxxvi, 244.

The term toxic goiter includes exophthalmic goiter and hyperfunctioning adenomatous goiter The statistics on exophthalmic goiter quoted in this article are based on 1 224 operations performed on 677 patients. The statistics on hyperfunctioning adenomatous goiter are based on 281 operations on 281 patients

Exophthalmic goiter occurs in two forms, the remittent and the chronic In the greater number of cases surgery is now the treatment of choice The high operative risk, however clearly contra indicates operation in three phases of the disease during an impending crisis (evidenced by a steady rise in the basal metabolic rate and loss of weight) during a

goiter are of
imary thyroid

ectomy can be performed with reasonable safety (2) those in which the advisability of thyroidectomy is doubtful, and (3) those in which indications for extended observation or preliminary measures are clearly defined.

It is important to increase the fluid intake to aid elimination and supply the higher calorie require

With regard to thyroidectomy the patient s age is the most important factor determining the amount of gland to be saved, the largest amount is preserved in young persons.

Recurrences and a lack of the improvement normal to the majority of patients are due to one of four factors (1) too early resumption of muscular exertion (overwork) and mental stress (2) infection (recurrent) (3) failure to remove a sufficient amount of thyroid gland or (4) irreparable visceral changes.

The syndrome due to an adenomatous goiter causing hyperfunction may resemble that of cardiovascular disease or that of true exophthalmic goiter In all of these cases, however the pre-operative medical measures and the strict operative procedures outlined for patients with exophthalmic goiter are of equal importance

The thirty five deaths (1 78 per cent) were due to (1) accidental cr
ism or (3) moderate
nary complications
resistance incident to the long-continued progress of the disease or some intercurrent cause such as hæmorrhage or infection. MORRIS H KAHN M D

Crile, G W and Lower W E. The Technique of Operations on the Thyroid Gland *Surg Gynec & Obst* 1922 xxxiv 258

The authors describe the surgical technique evolved by them as the result of their experience in 3 512 operations on the thyroid gland.

LIGATIONS

Ligations are done under local anæsthesia and analgesia without moving the patient from bed The superior thyroid artery is the artery of choice The skin, subcutaneous tissues muscles etc. are flooded with 1 200 novocaine solution The skin is divided parallel to the folds of the neck, the muscle fibers are separated with a narrow blade hæmostatic forceps and the upper pole of the gland is exposed The artery is then picked up and ligated with silk A second silk ligature is passed around most of the superior pole of the gland This tissue and the subcutaneous margins are flooded with a 1 600 quinine urea hydrochloride solution. The skin is closed with skin clips which are removed on the third day

TYPICAL RESECTION OF THE THYROID GLAND

The patient is placed in an inclined position feet downward, with the base of the neck elevated by a small pillow so as to elevate the chin. After infiltration of the skin and subcutaneous tissues with 1 200 novocaine solution the incision is made parallel to the natural folds at the juncture of the middle and lower thirds of the neck. In cases of small goiters, the preglandular muscles are divided vertically and held apart by retractors but in cases of medium sized or large goiters they are divided transversely between special muscle clamps after the areas to be grasped and divided have been infiltrated with novocaine.

The capsule and the entire portion of gland to be removed are then infiltrated with 1 200 novocaine

solution, care being taken not to infiltrate the recurrent nerves The superior thyroid arteries are

a clean field, and contact with the trachea or larynx is avoided All vessels held by forceps are tied and a warm, moist gauze sponge is laid on the field

After a thorough inspection of the field for bleeding the head is raised and the preglandular muscles are united with a buttonhole stitch of catgut The vertical incision in the muscles is closed by suture a small drain is inserted, and the skin is closed with clips The drain is removed in twenty four hours.

The procedure may be stopped at any point if the patient s condition indicates such interruption, in which case the wound is dressed with flavine or sterile gauze and the completion of the operation is

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Lukowsky A.: Diffuse Fibromatosis of the Mammary Gland and Its Transition to Carcinoma (Ueber die diffuse Fibromatose der Mamma und ihren Uebergang in Carcinom) *Deutsche Ztschr f Chir* 1921 clxvii, 81

There is as yet no unanimity of opinion regarding the nature of diffuse fibromatosis Some authors consider it a tumor others regard it as the product of chronic inflammation while still others take a middle ground

Lukowsky first reviews the literature and then describes the structure of the tissue in twelve cases

and an irregular arrangement of the gland ducts may strengthen the suspicion of carcinoma, but do not indicate it definitely The only certain criterion of cancer is a destructive growth, and as long as this cannot be demonstrated a decision as to whether carcinoma is present or not is impossible.

Diffuse fibromatosis is neither a true tumor nor an inflammation it is to be regarded as a chronic

Every breast with diffuse fibromatosis should

cancer nodule may be found after the lapse of time,

because at the time of the excision for examination a small focus of carcinoma may have remained in the parts left behind The specter of approaching carcinoma always threatens Hence it is important for the surgeon to amputate the breast when a diagnosis of chronic cystic mastitis has been made.

(COLLEY (Z)

TRACHEA AND LUNGS

Weiss, E. and Krusen, F H A Foreign Body in the Lung for Thirty five Years Complicated by Abscess and Tumor Formation. *J Am M Ass* 1921 lxxvii, 506

This very interesting case was that of a woman 37 years old who, when 13 months of age had a violent attack of choking and coughing due apparently to the inhalation of a foreign body Subsequently she was troubled continuously with cough and expectoration At the age of 7 years a thoracotomy was performed but was unsuccessful Except for the chest condition she was healthy She had had six children Four months before her death she was operated upon for some abdominal condition After the operation the cough became more severe and she began to expectorate bloody sputum She then was confined to her bed and suffered with severe pain in the right lower chest.

At the time she was seen by the authors she was emaciated, sallow and slightly dyspnoeic Flatness at the right base and extreme tenderness of the skin were present

slightly diminished and there was a moderate leucocytosis

and when it was separated

Sections showed chronic inflammatory tissue and

Roscoe C. Webb M.D

Kernan J D., Jr Report of an Upholsterer's Tack in the Right Main Bronchus for Seven Years: Removal by Peroral Bronchoscopy: Drainage of Lung Abscess: Recovery *Laryngoscope* 1922 xxxii 102

Kernan reports the case of a girl, aged 21 years who had suffered from an obscure pulmonary condition for seven years

When first seen by the author she complained of hæmoptysis which had begun eighteen months previously For seven years previously she had had frequent attacks of fever night sweats sharp pain in the right axilla and a hacking cough

On physical examination the right lung showed slightly diminished expansion and a triangular area at the right base behind, where diminished voice and breath sounds and fremitus were noted Râles were present over the right lung and there was a slight leucocytosis Careful study of the X ray revealed a shadow suggesting a tack at the base of the right lung

Under morphine and cocaine anæsthesia a bronchoscope was passed. The right bronchus was

into an abscess cavity The tack was found and removed and the cavity cleaned. The symptoms cleared up rapidly

The author calls attention to the importance of directly questioning all patients with obscure pulmonary conditions regarding the aspiration of a foreign body Roscoe C. Webb M.D

Haynes, G S. and Gaskell J F : A Case of Primary Carcinoma of the Lung. *Brit M J* 1922 i 222

Primary carcinoma of the lung is rare. Hamman states that this condition was found in only 2 per cent of 46 169 autopsies and according to Ewing

bronchial mucous glands and (3) those arising from the lung substance Clinically carcinoma of the lung presents itself as a chronic inflammatory disease of the lungs, a chronic pleurisy with effusion or a local patch of permanent consolidation The usual diagnosis is pulmonary tuberculosis fibroid phthisis or unresolved pneumonia

The following case is reported

A polisher 27 years of age was admitted to the hospital in December, complaining that for the last three weeks he had been troubled with dyspnœa cough and hæmoptysis. When examined he was

found to be poorly nourished and slightly dyspnœic but not cyanosed The physical signs were those of pleurisy with slight effusion and patchy consolidation of the lower lobe of the right lung The condition was thought to be tuberculosis Dur

rate The patient was kept in the open air and at the end of three weeks had slightly improved

Toward the end of January well marked signs of pneumothorax appeared There was no pain or distress and the onset was very insidious X ray examination showed hydropneumothorax on the right side A few days later a sterile blood-stained fluid containing polymorphonuclear and mononuclear leucocytes in about equal numbers was aspirated from the right chest The pneumothorax slowly disappeared leaving the right chest flat and immobile dull to percussion, and with very feeble breath sounds The heart was displaced to the right. Early in March enlargement of the left cervical glands was noted Toward the end of the month hoarseness, stridor and œdema of the face began and the superficial veins of the upper thorax became engorged. The obstruction increased and the patient died in April During the last eight weeks his temperature was normal or subnormal

of the bronchus almost to the bifurcation The

ment of the thoracic duct The bronchial and tra

examination showed the lung substance to be replaced by a mass of cubical cells which were arranged irregularly in most areas but here and there showed palisade-like arrangement. The original structure of the lung was indicated only by bronchial cartilage belonging to the larger bronchi The condition was diagnosed as carcinoma of the cuboidal-cell type which probably had grown from the term [illegible] The gland ey nodules c

Points

the patie.

toms (five months), the similarity of the symptoms to those of tuberculosis of the lungs, the temporary improvement under open air treatment the total absence of pain the involvement of one lung only, and the rapid enlargement of the mediastinal and cervical glands. Although it was the right lung which was involved, the left lymph glands were considerably more affected than the right lymph glands. The path of spread was probably along the thoracic duct Ralph B Bettman M D

Imperatori, C. J : Primary Adenocarcinoma of the Bronchus. *Laryngoscope*, 1922 xxii, 123.

For the past ten years the patient had felt weak and usually tired Ten weeks before his admission to the hospital he became weaker and developed a cough with expectoration, fever and night sweats. There was no hemoptysis or pain in the chest

Physical examination revealed a poorly nourished anemic male with a long chest of the phthisical type with signs of fluid at the base Compensated endocarditis was found There was no clubbing of the fingers The sputum examination for tubercle bacilli was negative

Roentgenograms made at intervals over a period of five weeks showed congestion of the upper lobes

tasis was made

A bronchoscopic examination revealed a mass of granulation tissue about 1 cm in diameter within

cavity was irrigated The granulation tissue nearly disappeared and an apparently hard white mass was seen protruding from the abscess cavity Microscopic examination of a section removed showed adenocarcinoma

Radium was then applied but the patient died of bronchopneumonia, the cancer growing rapidly after the biopsy

present in both lungs Sections showed the tumor

HEART AND VASCULAR SYSTEM

Schmidt, F : Intracardial Injections (Ueber die intrakardialen Injektionen) *Orvosi Hetil* 1921 lxv 361 372

The author gave intracardial injections in the cases of fifteen moribund patients with inoperable diseases He used camphor caffeine strophanthin, adrenalin, pituitrin, digitalis, and strychnin. In the last cases only strophanthin and adrenalin in small doses were employed, either alone or in combination The mixture consists of 0 2 to 0 3 c. cm. of strophanthin, 0 1 to 0 2 c. cm. of adrenalin solution and 2 to 3 c. cm. of sterile distilled water

The fluid must be injected slowly as rapid injection may cause tetanic spasm of the heart,

the auricle and ventricle and the dividing septum,

wall Schmidt sought the apex of the left ventricle.

The injection always stimulated the heart action and in some cases maintained it for as long as three da

act the drug cannot be given either by any other way because of inadequate circulation of the blood heart weakness following severe illness collapse

cases being to gain time for infusion) and lightning stroke injury from electricity and exposure to intense cold VON LOBMAYER (Z)

Hedblom C A. The Treatment of Pericarditis with Effusion *Minnesota Med* 1922 v 40.

Inflammatory exudation in pericarditis suggests infection and with rare exceptions this is probably always present The most frequent cause of primary pericarditis is the infective organism of acute articular rheumatism Other primary disease conditions commonly associated with it are pleurisy pneumonia, the acute general infections, tuberculosis and chronic nephritis In young children and infants suppurative pericarditis seems to be largely a complication of pleurisy and pneumonia

Clinically pericarditis with effusion is classified usually as serous, hemorrhagic, or purulent, or as some combination of these types of exudates. Of 100 cases with necropsy records at the Mayo Clinic *since 1910 twenty-one* were acute fibrous, twenty adhesive or obliterative twenty-seven serous, twenty-one purulent, and four hemorrhagic.

The most characteristic symptoms are increased precardiac dullness, feeble or absent heart sounds,

be found The onset may be insidious and the symptoms latent Exploratory pericardiocentesis may be necessary to establish the presence of fluid

caine as it enters is as simple and painless as ov

ploratory aspiration of the pleural cavity The point of election for aspiration seems to be in the region of the left mammary line the fifth inter

space

A serous effusion is usually sterile but may be infected. A purulent exudate is usually infected, but it may be tuberculous or secondary to malignant disease A sterile exudate except the persistently recurring type should be evacuated by aspiration through a small short needle An infected exudate should be evacuated by pericardiotomy after preliminary resection of the cartilage to secure wide open dependent drainage

pressure

Because of anatomic variations in the reflection of the left pleura a transpleural operation may be unavoidable. In suppurative pericarditis, however, the leaves of the pleura are probably adherent and therefore wall off the pleural cavity

To secure the most efficient drainage and prevent possible encapsulation of exudate behind the heart the most dependent parts of the pericardial cavity on each side of the vena cava must be reached

As it promotes evacuation of the exudate, irrigation seems to be a rational measure supplementary to drainage.

On account of the severity of the primary disease conditions with which especially purulent pericarditis is associated the mortality rate will probably remain relatively high it may be reduced materially however by the earliest possible diagnosis prompt evacuation of exudate causing mechanical embarrassment to the heart and wide-open adequate drainage in the infected type of the disease L. H. Fowler M.D

PHARYNX AND ŒSOPHAGUS

Henrard E.: The Extraction of Foreign Bodies from the Œsophagus and the Upper Respiratory Passages (Extraction des corps étrangers de l'œsophage et des voies aériennes supérieures) *Arch méd belges* 1921 lxxiv 897

Henrard has extracted a coin from the cricoid stricture of the œsophagus under X ray control in fifty five cases

When a foreign body is arrested above the cricoid stricture an attempt should be made first to remove it under screen control If this fails its extraction by means of the œsophagoscope should be attempted If this fails also external œsophagotomy is indicated.

If the foreign body has not passed the aortic stricture of the œsophagus extraction under screen control should be tried first, and if this fails the œsophagoscopic method should be attempted or the foreign body pushed down to the cardia.

If the body is in the lower third of the œsophagus it should be extracted through the cardia after gastrotomy No attempt at extraction from above should be made in this case as it would be attended by the danger of bringing the foreign body to the aortic stricture from which it might be impossible to extricate it.

In cases of foreign bodies in the upper respiratory tract (trachea, bifurcation of the bronchi) the bronchoscopic method seems indicated, but is very difficult In Henrard's opinion it would be better to attempt extraction under screen control In certain cases of bronchial foreign bodies it is necessary to make a thoracic flap opening The foreign body may then be removed under screen control. W A Brennan

Baillin, M and Saltzstein H. C Perforations of the Œsophagus; Report of a Case of Transpleural Œsophageal Fistula. *Surg., Gynec & Obst* 1922 xxxiv 42

The authors report a case of transpleural œsophageal fistula developing during lobar pneumonia and accompanied by pyopneumothorax in which ingested food was discharged through the thoracic drainage opening The perforation healed spontaneously after many months They have been able to find in the literature the reports of only six cases in which the œsophagus perforated into the pleural cavity without communicating with the trachea, bronchi, or lungs. These cases are abstracted

The literature contains the reports of œsophageal perforation due to congenital malformation neoplasms, aneurisms, œsophageal instrumentation, surgical, stab and gunshot wounds, foreign bodies spontaneous rupture, acute œsophagitis, diverticula, simple or peptic ulcer and luetic ulcer and tuberculosis. The authors discuss these causative conditions J D Ellis, M.D

Van Wildenberg L. Diverticula of the Pharynx and Œsophagus (Les diverticules du pharynx et de l'œsophage) *Bull Acad roy de méd de Belg* 1922 5 s ii 20

There are two types of œsophageal diverticula

method as it will not reveal the lower part of a foreign body in the œsophagus

tion or X-ray examination. By these means also not only the volume of the diverticulum but also

fixes the diverticulum to the skin and delays its removal until a barrier of protective granulations has been formed in the mediastinum. Other operators have invaginated the diverticulum, but the dangers to respiration contra-indicate this method.

Van Wildenberg, following the suggestion made by Schmidt in 1912, dissected the sac and did a diverticulopexy, affixing the fundus of the sac in the most elevated part of the wound. He has performed this operation in seven cases. In three he ultimately removed the sac. There were six recoveries and one death. The first cases were operated upon in 1917. In Van Wildenberg's opinion it is best to do the diverticulopexy first. The patient may then be allowed to go home and after eight days will feel perfectly well. Fifteen days to three weeks later the pocket should be excised and the pharyngeal wound sutured. The last case treated, that of a man aged 56 years, is described in detail and illustrated.

W. A. Brenton

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Lerche, W.: Insufficiency (Eventration) of the Diaphragm; with the Report of a Case and the Surgical Treatment Thereof. *Surg. Gynec. & Obst.* 1922, xxxv, 824.

Cases of abnormally high diaphragm have been

or acquired. Reference is made to two cases of the congenital type reported in the literature.

Acquired insufficiency may be either acute or

rhage, tumor of the spinal cord or mediastinum, tuberculous bronchial glands, etc., may affect the

that of a wo
following a
to a bit of
coughed up a part of any liquid swallowed. Œso-

stomach and chest showed the heart to be pushed to

At operation through a left rectus incision diaphragmatic insufficiency was found; the sac-like dilatation contained the dilated, rotated stomach and colon. The diaphragm was pulled down and

in the case reported this fact was of no value in the differential diagnosis between diaphragmatic hernia and insufficiency.

The value of the operation described has not been determined, although seven months later the symptoms had markedly decreased, the patient had gained in weight and was able to work, and it seemed unnecessary to attempt the repair of the œsophagotracheal fistula.

Miller R. Hoon, M.D.

Cullen, T. S.: A Method of Dealing with Intestinal Loops Densely Adherent to an Umbilical Hernia. *J. Am. M. Ass.* 1922, lxxviii, 564.

ring
hernia
away.
If

dense y adherent the incarcerated portion is tied

off and removed with the sac If the omentum is free the ring is closed by the overlapping method

If intestinal loops are contained in the sac the latter is opened from the neck outward Occasionally the loops of intestines must be dissected away from the sac wall a procedure which leaves many bleeding points on the bowel.

The author reports a case of umbilical hernia of eighteen years duration in a man of 68 years The first operation was done in 1908 by the overlapping method The patient made a rapid recovery and was well for ten years. A protrusion then appeared at the site of the old hernia and obstruction occurred. A second operation was performed under procaine anæsthesia The sac contained many loops of adherent bowel so densely attached that liberation was out of the question The loops were separated from each other by dissection thirty to forty patches of sac being left adherent to the intestinal loops. These loose edges were carefully trimmed off with the scissors The patches were smooth and did not bleed. The ring was closed by the overlapping method The patient recovered and three years after the second operation is perfectly well.

By leaving these patches on the bowel much time was saved The patches served to protect the bowel, and there was no bleeding or raw surface to cause subsequent intestinal obstruction.

The condition of the hernia and intestines in different stages of the operation is illustrated by three sketches. C. F Andrews, M.D

Farr R. E. **Closure of Large Hernial Defects in the Upper Abdomen.** *Surg Gynec. & Obst.*, 1922 xxxiv 264

Farr reports the histories of three cases of repair of the abdominal wall with fascial flaps from the chest

A vertical incision is made over the sternum and the sheath of the pectoral muscles exposed as high as the nipple line A quadrangular flap 10 in long, with its base below and composed of pectoral fascia and a considerable amount of muscle is dissected downward until a flap approximately 6 in in width has been raised The flap is then sutured over the hernial opening

The lower portion of the thorax is an ideal area for the formation of a fascial flap If flaps can be obtained without too greatly reducing the strength of the area from which they are cut, the pedicled flap method may be effectually applied to hernia in any part of the abdominal wall. H. A McKnight M.D

GASTRO-INTESTINAL TRACT

Ruben, M. A.: **Multiple Primary Carcinomata of the Pylorus and of the Ectopic Gall Bladder** *Surg Gynec. & Obst* 1922 xxxiv 201

The case reported is unique in that the patient received surgical treatment at one operation for primary carcinoma of two organs. It is of interest also because the location of the tumors possibly supports the theory that mechanical lesions cause the development of malignant growths and because the location and the ligamentous connections of the gall bladder were unusual

The patient was a woman 67 years of age who gave a history of four weeks of light pain on the right side

below the umbilicus The lungs, heart liver spleen kidney, and pelvis were negative. A smaller tumor was palpable just behind the first one No ascites was present and there was no history of jaundice. Gastric analysis and X-ray examination of the ileum, cæcum, and colon were practically negative. A probable diagnosis of cystic tumor of the mesocolon was made.

At operation the larger tumor was found in the transverse mesocolon close to the hepatic flexure The gall bladder could not be located in its normal position. The cystic tumor was found to be connected with the duodenum by a duct in the hepaticoduodenal ligament. In the upper part of the tumor were hard particles the size of a hazel nut A pyloric carcinoma was found on the greater curvature

About 20 cm of the transverse colon were resected and the bowel joined by side to-side anastomosis. A resection of the stomach was done, both ends were closed, and an anterior gastro-enterostomy with a Braun entero-anastomosis was performed.

The patient reacted satisfactorily and her condition at first seemed favorable but five days later signs of peritonitis developed and death occurred on the eleventh day

difference in their macroscopic and microscopic appearance, it was evident that the growths were distinct primary tumors.

In the literature the frequency of primary carcinomata has been given as 2 to 3 per cent. Very rarely three primary carcinomata have been found in the same patient. Billroth emphasized certain [illegible] of primary tumors as con- [illegible] He did not accept [illegible] did not show a defi [illegible] could not be traced [illegible] of the matrix, and which did not show a metastasis In order to group the tumors according to their location Bauer has proposed the following scheme (1) one organ or system of organs for instance, the stomach and rectum (2) symmetrical organs—breasts and ovaries (3) different systems of organs—skin and rectum.

The author calls attention to the presence in a small percentage of cases of a ligamentous connection between the neck of the gall bladder and the transverse mesocolon Spalteholtz called it the ligamentum hepaticocolicum."

Guillaume, A. C. The Prognosis in Acute Intestinal Occlusion (Le pronostic dans l'occlusion intestinale aigue) *Presse méd* Par 1921 xxix, 822

This article is a statistical study of the mortality of intestinal occlusion. In 3,829 cases operated upon in the last thirty years the mortality was 63.2 per cent. In cases operated upon previous to 1900 it was 66 per cent and after that date fell to 52 per cent. This decrease Guillaume attributes partly to

causes the mortality was 56.7 per cent.

The prognosis in various types of cases is discussed in detail with tables of statistics and there is a particularly inclusive comparative discussion of the published statistics of intussusception in the different periods of life. The author notes particularly the gravity of intestinal obstruction due to biliary calculus.

The mortality of ileus is compared with that of

C. L. Hathcock, M.D.

Johnson, R.: Carcinoma of the Jejunum and Ileum. *Brit. J. Surg.* 1921, ix, 422.

Johnson excludes from his discussion growths involving the duodenum and the ileocecal valve. He draws attention to the remarkable rarity of both primary and secondary growths in the duodenum and to the fact that malignancy is much less rare in the lower part of the ileum than in the upper part of the jejunum.

Three cases are reported in this article, one a case

which a ring-like growth was found about 6 in.

third case the distention of the bowel with fluid contents suggested the presence of free peritoneal fluid.

Symptoms emphasized by the author as characteristic of carcinoma of the jejunum and ileum are abdominal pain, vomiting, increasing constipation, and rapid wasting. The duration of the symptoms is variable. Carcinoma of the small intestine has been

diagnosed before operation as carcinoma of the stomach, duodenal ulcer, strangulated hernia, and intestinal obstruction due to a peritoneal band.

If there is no obstruction the operative treatment consists in the removal of the growth and the glands draining it. If marked obstruction is present the

ing ring-like form, (2) the polypoid form, (3) the ulcerative type, and (4) the colloid type. Multiple growths have been found. Metastases are frequent and usually develop in the mesenteric glands, the peritoneum, and the liver. Histologically the growths are carcinomata with columnar, sphenoidal, or polyhedral cells.

arise from pancreatic rests. M. R. Lewis, M.D.

Goullioud, Gastro-Entero-Anastomosis without Turning of the Jejunal Loop (De la gastro-entéro-anastomose sans retournement de l'anse jejunale) *J. de chir.* 1921, xix, 137.

Goullioud states that in performing a gastro-enterostomy the majority of French surgeons make a turn in the jejunal loop. As a result, the food coming from the stomach and progressing from left to right continues to discharge into the intestines in the same direction. This method is termed "isoperistaltic gastro-enterostomy."

Goullioud does not twist the jejunal loop but

Following removal of the transverse colon and exposure of the mesocolon, Goullioud finds the beginning of the jejunum, opens the mesocolon in an avascular area near its base, and through this opening seeks the point in the posterior surface

anastomosis he makes with three rows of sutures. As a rule its proximal extremity is about two finger widths from the ligament of Treitz but sometimes it is closer. The two sides of the mesocolon breach are fixed to the gastric wall immediately beneath the anastomosis in order to prevent herniation of the small intestine into the posterior omental cavity and deviation of the anastomosis due to

direction beginning at the ligament of Treitz. The jejunum deviates to the right so that when the anastomosis is made at a distance from the ligament of Treitz the jejunum has a natural direction to the right and it is necessary to turn the jejunal loop as in the isoperistaltic gastro-enterostomy

Goulhoud does not lay claim to innovation. The short-loop method is attributed to Paterson who in 1901 found that it prevented circulus vitiosus Hochenegg described the method in 1897 Roux employed it in 1898 and abandoned his Y method. Mayo also strongly recommends the formation of the anastomosis near the Treitz ligament He insists on the left direction of the duodenum at its beginning as this prevents a vicious circle and chronic regurgitation of bile

W A Brennan

Davis D L. and Poynter C. W M : Congenital Occlusions of the Intestines; with Report of a Case of Multiple Atresia of the Jejunum. *Surg Gynec. & Obst* 1922 xxxiv 35

The authors present a brief historical review of the more important articles dealing with the subject and report a case of multiple jejunal atresia

There seems to be no point in the intestinal canal where atresia appears with any constancy and in such a short segment as the duodenum the lesion may occur at any point In a series of 234 cases studied atresia developed in the ileum and cæcum in 101 cases, in the duodenum below the papilla in seventy five and above the papilla in fifty nine, in the jejunum in sixty and in the colon in thirty-nine Of sixty-seven cases of multiple atresia there were from two to nine occlusions in the jejunum and upper ileum in slightly more than 50 per cent occlusions of the small intestines and colon in 20 per cent, and scattered occlusions in the remainder

Emesis almost always occurs and usually begins on the second day of life. Hæmatemesis may be present appearing frequently with the first emesis. Bile may be vomited even if the obstruction is above the papilla. Constipation is usually complete, but small amounts of a grayish mucus may be noted when the obstruction is below the papilla, and small green movements may occur when the obstruction is above the papilla. In some cases slight icterus or anuria may be present

Errors of development, congenital volvulus intussusception and strangulation of a loop of the canal. Multiple atresia cannot be diagnosed The treatment is surgical. The authors advise entero-anastomosis under procaine anæsthesia

The case of multiple atresia reported was that of a child five days old who had had symptoms of intestinal obstruction for two days before the time of operation when an external enterostomy was done at the site of an occlusion of the ileum. Death occurred six hours after the operation Postmortem examination showed the jejunum to be composed of several segments blind at both ends and from 1 to 17 cm. in length The arteries of the mesentery appeared normal on macroscopic examination but showed sclerosis on microscopic examination of the regions in which hiatus occurred The process appeared to be primary in the smaller radicles and the authors believe that it cannot be classed as a developmental anomaly

George H. Jackson M D

Magoun J A. H., Jr Dilatation of the Colon Simulating Hirschsprung's Disease. *Surg Gynec & Obst* 1922 xxxiv 198

Hirschsprung divided cases of Hirschsprung's disease into two types, true megacolon occurring in

of fœtal peritonitis as a cause of atresia is given by the results of examination of the authors material, most of the evidence indicating that the primary lesion was in the arteries, causing a sclerosis, and that the degeneration of the mucosa was secondary to this sclerosis.

The diagnosis of the intestinal obstruction generally presents little difficulty but localization of the lesion is difficult and is usually made too low in

in which obstinate constipation abdominal distention, and emaciation have been present since birth but the patient has reached adult life.

2 Cases in which chronic constipation has been present for years and the symptoms of Hirschsprung's disease developed within a short period without demonstrable mechanical obstruction

3 Cases of megacolon due to mechanical obstruction, such as (a) those occurring in infancy and due to atresia or stenosis of the rectum, (b) those occurring in adult life and due to tumors volvulus adhesions inflammatory stenosis, or external pressure on the bowel.

The author reports the case of a man 36 years of age which falls into the last group the cause being a carcinomatous papilloma in the first part of the descending colon. Although the patient was con

The X-ray demonstrated a dilated colon. At first, a modified Brown operation was performed. At the end of five months the patient had gained 35 l

dition there was a carcinomatous papilloma of the ring type. The muscular layers of the colon were markedly hypertrophied. Merle R. Hoox, M.D

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Willis, A. M The Relative Merits of the "Ideal Cholecystotomy" Cholecystectomy and Cholecystostomy *Surg Gynec & Obst* 1922 xxxv 183

Gall-bladder cases are divided into two groups The first comprises the acute cases and those with long-standing severe pathology Many of the persons so affected are elderly and obese, and in some cases there may be complications When the abdomen is opened disease of the gall-bladder is distinctly apparent Although cholecystectomy seems indicated, the author advises cholecystostomy because of (1) the disastrous results which sometimes attend cholecystectomy in these cases

change and slight damage to vital organs—cases in which it is sometimes difficult to tell whether or

trouble, and that therefore cholecystectomy without drainage is the operation of choice

Among other functions the normal gall-bladder stores and concentrates the bile While patients whose gall bladders have been removed are relieved of their symptoms and resume their normal lives, it cannot be proved that they have not suffered some obscure disturbance of function Therefore the promiscuous sacrifice of gall-bladders in such conditions as cholelithiasis without the presence of infection is to be deplored For these in properly

This statement applies also to cases of silent stone discovered on X-ray examination of the gastro-intestinal tract or at operation in which there is no history of gall bladder disturbance or there has been at most only a mild, recurring epigastric distress. Silent calculi, acting as foreign bodies, may be causes of infection but do not justify either cholecystectomy or cholecystostomy

O S Pascoe M D

Dale

The introductory paragraph of this article traces the development of the different types of anastomosis during a period of thirty years

Bile may be drained from the gall bladder to the

development of the different types of anastomosis, dealing first with the purely theoretical side and then

tive t

Bec

and t

used In twenty-one anastomoses done in Kehr's clinic the gall-bladder was employed in twelve and the hepatic duct in nine Other cases have been reported in which choledochoduodenostomies were performed In one instance a rubber prosthesis was used as a means of effecting anastomosis In the very great majority of reported cases however the anastomoses were made with the gall-bladder

Because of the normal physiological processes of digestion the duodenum is the natural site for the anastomosis but its lack of mobility and its partial covering by peritoneum in addition to the complicated technique of a cholecystoduodenostomy, have led to the development of other types of

preferred

Cholecystostomy is a simple temporary method for the evacuation of gall-stones stones in the common duct, and infected bile It is used also in cases in which immediate drainage is indicated as a temporary measure However in cases of *retention of bile and distention of the gall bladder* due to a neoplasm, carcinoma of the pancreas, or *extrinsic*

up infection but the operative technique is very difficult. Anastomosis with the jejunum is less satisfactory and anastomosis with the transverse colon interferes with digestion and the metabolic processes and has the highest risk of infection However the probability of infection is not as high practically as theoretically

Cholecystogastro-enterostomy has been shown to be satisfactory both from a physical and a physiological standpoint The former belief that bile in the stomach retarded the digestion of the albumins and impaired the gastric secretions has been disproved clinically and experimentally It is pointed out that cholecystogastro-enterostomy is the operation of choice because of the satisfactory clinical and operative results and the simplicity of the operative technique

The authors review seventeen cases giving the history diagnosis operation, operative findings postoperative developments and the end results. In this group there were twelve cholecystogastro-enterostomies three cholecystocolostomies and two cholecystojejuno-enterostomies with no operative deaths The cases were followed for varying periods after the operation

For all the operations preliminary exploration is recommended. This should include special examination of the gall bladder region separation of the adhesions and careful selection of the sites of anastomosis In cases of distended gall bladder or numerous stones, the gall bladder should be emptied. The technique and the different steps in the operations are given in detail Cholecystogastro-enterostomy is strongly advocated

Operative intervention is indicated in the following types of cases

1 Cases of complete or incomplete occlusion of the common duct with dilatation of the gall bladder and retention of bile

2 Cases of hydrops of the gall bladder with obliteration of the cystic duct, whether the cause of the condition is known or not.

3 Cases of multiple or single biliary calculi in which there is obstruction of the cystic or the wall has not been

dilteration of the

common duct whether this is caused by a congenital malformation or by a neoplasm of the biliary ducts the pancreas or more extensive involvement.

The authors conclusions are as follows

o be considered

to repair when

the case demands rapid intervention

3 It entails the least operative risk and causes no disturbance of the physiological digestive processes and no complicating infections

4. It is indicated in chronic icterus when obstruction or pressure on the gall-bladder by neoplasms has occasioned retention with distention of the bladder This indication is limited only by the possibility of excision or the patient's general condition

5 It is utilized with advantage in the treatment of certain cases of icterus the cause of which it is difficult to determine and in the treatment of biliary fistulæ if the condition of the gall bladder warrants anastomosis

6 A certain degree of bladder distention is necessary for the establishment of cholecystogastrostomy Because of this fact the operation is indicated especially in cases of lithiasis for aged patients, for those whose general condition is precarious and for cases of occlusion of the common duct which require complex operative manœuvres

7 This operation must be classified as a palliative measure The unexpected successful results which it has sometimes given depend upon errors of diagnosis and the curability of the inflammatory lesions But even in cases in which the development of an obliterating tumor means death this operation is often the cause of a temporary amelioration which may be of considerable duration

8 In all of these cases there is improvement of symptoms Disappearance of itching and a decrease of the icterus are always observed and frequently there is an arrest of the cachexia

W O *Johnson M D*

Hartman, F L. Smyth C M Jr and Wood J K W : The Results of High Ligation of the Cystic Duct in Cholecystectomy *Ann Surg 1922 lxxv 203*

The experiments reported were carried out upon a series of ten dogs In each case the length and diameter of the cystic duct were measured and the gall bladder was removed close to its neck. One dog died during the operation The remainder were chloroformed and subjected to autopsy at intervals varying from six weeks to fourteen weeks after the operation In seven the cystic duct stump was dilated quite markedly and filled with bile In another a bud like dilatation filled with bile was found at the end of the cystic duct stump In some the cystic duct stump was increased in length

On histologic examination of a section from these newly formed bladders all the coats of the gall bladder could be recognised.

In one dog in which the cystic duct was cut off practically flush with the common duct there was no dilation of the small stump but a marked dilation of the common and hepatic ducts was found In two of the eight cases with dilation the bile had become inspissated and apparently was beginning to form calculi. Under the microscope these dilations suggested chronic catarrhal cholecystitis It seemed evident that the dilated duct did not have the power to force the bile out.

Two clinical cases of dilation of the cystic duct stump observed by Deaver and Stewart are reported.

The conclusions drawn are as follows

1 When a cystic duct stump is left it usually dilates to form a pseudo-gall-bladder hence there

may be a recurrence of symptoms after a cholecystectomy

4 The fact that after the removal of the gall bladder the body attempts to restore the normal condition in the biliary system through dilation of the ducts and the stump of the cystic duct indicates that the gall bladder has a definite function

CARL R STEVENS, M D

Willis, A. M Some Problems in Connection with the Surgery of the Biliary Tract. *Ann Surg* 1922 lxxv 96

The successful treatment of gall-bladder disease depends on an accurate diagnosis This diagnosis is difficult even when we have as aids the complete history a careful physical examination, a roentgenological examination the use of the duodenal tube and magnesium sulphate, and abdominal exploration

The number of removed gall-bladders showing only simple cholecystitis as compared with those showing cholecystitis with calculi is cited From this comparison Willis is inclined to believe that the

cholecystectomy are malignancy hydrops, cicatricial closure of the cystic duct, and the strawberry gall-bladder

The choice of cholecystostomy and drainage of the gall-bladder instead of cholecystectomy is based on

1 The function of the gall-bladder in digestive processes as shown by (a) the concentration of the bile, and (b) storage of the bile.

2 The increased surgical risk of cholecystectomy when the patient is debilitated.

3 The presence of dense adhesions and a contracted and thick walled gall bladder

4. The good results obtained from cholecystostomy in seemingly functionless gall bladders

5 The lessened chance of injury to adjacent structures in cholecystostomy

6 The fact that conditions following cholecystostomy are more favorable for secondary operations if the latter are necessary

The author does not agree with the accepted is based on the poor results obtained by cholecystostomy and drainage and the results in animal experimentation which showed (1) that when sterile bile is allowed to escape into the peritoneal cavity dense adhesions are not formed and the action of the bile is not lethal (2) if a foreign body is inserted the adhesions become very dense and numerous (3) if infection is introduced the bile plus a foreign body plus infection causes very dense adhesions and often leaves a pericholecystitis as severe as that preceding the operation

Leakage of bile after the removal of the gall bladder is rare and drainage can be dispensed with to a great extent In thirty-eight cases treated by cholecystectomy without drainage in a period of five years, and in a later series of seventy two cases in

adhesions can be avoided

The ideal cholecystotomy as performed by Meredith in 1883 has been severely condemned.

a definite class of cases might be relieved of the gall bladder syndrome with preservation of the organ.

GEORGE I SUTTON, M D

Banting, F G., and Best, C. H.: The Internal Secretion of the Pancreas. *J Lab & Clin Med* 1922 vii, 251

In reading an article on the relation of the islets of Langerhans to diabetes which gave a résumé of degenerative changes in the acini of the pancreas following ligation of the ducts, the idea presented itself to the authors that since the acinous, but not the islet tissue degenerates after this operation advantage might be taken of the fact to prepare an active extract of islet tissue A subsidiary hypothesis upon which the experiments here reported were based was that trypsinogen or its derivatives is antagonistic to the internal secretion of the gland

From the investigations of different observers it may be concluded (1) that the secretion produced by the acinous cells of the pancreas is in no way connected with carbohydrate utilization (2) that

accomplish this end or (1) the blood might be

modified while passing through the islet tissue that is the islands might act as detoxicating stations and (2) the islets might produce an internal secretion.

The authors believe that the experiments herein reported demonstrate that the latter mechanism is in operation. The majority of their experiments were performed upon female dogs which were completely depancreatized at the initial operation. The pancreatic tissue removed after seven to ten weeks degeneration showed an abundance of healthy islets and a complete replacement of the acini by fibrous tissue

In the course of the experiments over seventy five doses of extract from degenerated pancreatic tissue were administered to ten diabetic animals. Since the extract has always produced a reduction of the percentage sugar of the blood and the sugar excreted in the urine the authors feel justified in stating that this extract contains the internal secretion of the pancreas While they have always observed a distinct improvement in the clinical condition of diabetic dogs after the administration of extract of degenerated pancreas, they state that it is very obvious that the results of their experimental work do not as yet justify the therapeutic administration of degenerated gland extracts to clinical cases of diabetes mellitus

The results of the experimental work reported may be summarized as follows

Intravenous injections of extract from the pancreas of the dog removed from seven to ten weeks after ligation of the ducts invariably exercised a reducing influence upon the percentage of sugar in the blood and the amount of sugar excreted in the urine

Rectal injections were not effective

The extent and duration of the reduction varied directly with the amount of extract injected

Pancreatic juice destroyed the active principle of the extract

That the reducing action is not a dilution phenomenon was indicated by the following facts (1) hæmoglobin estimations before and after the administration of the extract were identical (2) injections of large quantities of saline did not affect the blood sugar (3) similar quantities of extracts of other tissues did not cause a reduction of blood sugar

Extract made o 1 per cent acid was effectual in lowering the blood sugar

The presence of extract enabled a diabetic animal to retain a much greater percentage of injected sugar than it would otherwise

Extract prepared in neutral saline solution and kept in cold storage retained its potency for at least seven days

Boiled extract had no effect on the reduction of blood sugar GEORGE E BEILBY M D

MISCELLANEOUS

Lamas, A. and Prat, D Hydatid Cysts of the Abdomen Simulating Ascites: Preperitoneal Hydatid Cysts (Kystes hydatiques de l abdomen à type ascitique—Kystes hydatiques prépéritonéaux) *J de chir.*, 1922 xix, 25

The authors have operated upon two cases of hydatid cysts which clinically suggested abdominal ascites due to tuberculosis There was a large progressive and diffuse abdominal distension which upon examination seemed to have all the characteristics of distension due to fluid Digestive disturbances from visceral compression, œdema of the lower extremities evidence of collateral circulation, and profound intoxication were present

At operation in each instance an enormous amount of fluid was evacuated In some cases this was purulent Escaping in the fluid were numerous small c— — — — The wall of ternal to the kened posterior wall the intestines could be seen

Heretofore the origin of the large cysts was supposed to be preperitoneal because they are situated between the muscles of the abdominal wall and the peritoneum. On the basis of their studies however the authors have come to the conclusion that they originate directly from the peritoneum

LOYAL E. DAVIS, M D

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES JOINTS, MUSCLES, TENDONS ETC

Tillier R.: The Individuality of the Metaphysis (De l'individualisme de la métaphyse) *Rev d orthop* 1922 xxix 21

From the point of view of evolution the long bone has three distinct parts the diaphysis, the metaphysis, and the epiphysis The individuality of the metaphysis is revealed in the examination of the long bones of young subjects in the period of growth. The juxta-epiphyseal or metaphyseal region possesses an anatomical individuality which is of particular importance in pathology Tuberculosis is localized most frequently in the epiphysis syphilis in the diaphysis, and osteomyelitis in the metaphysis These points are illustrated by roentgenograms. In Tillier's opinion the point of union between the diaphysis and metaphysis plays a rôle in the pathogenesis of certain malformations and traumatic lesions W A BRENNAN

Stephan R.: Polyperiostitis Hyperæsthetica (Polyperiostitis hyperæsthetica) *Mitt a d Grenzgeb d Med u Chir.*, 1922 xxxiv 201

Within the last three years Stephan has observed five cases of a disease that he is unable to classify By some authors the condition has been ascribed to

a tuberculous infection of the skeletal system Stephan suspects a systemic disease of the entire periosteum The course is chronic in limited periods, and in the beginning there are very long intervals of latency Almost always there is a subfebrile rise of temperature In the later stages the condition, which is doubtless an inflammatory process, becomes generalized over the entire skeleton

The histories of the five cases observed by the author are given in detail Two were cases of the fully developed and generalized disease one was a case in which the disease was progressive but not yet very extensive and the two others were cases in which the condition was in a very early stage The five patients were females

The typical findings of the condition, especially in the first two cases, were

1 Thickening of the periosteum which caused a very dense shadow in the X ray picture This was present in only certain of the diseased portions of the body The bone itself was unchanged in marrow and cortex In the first case the specimen obtained at operation showed a hard callous tissue of periosteal fibers containing few cells or vessels that is, a periosteal tissue with simple proliferation, without or with only slight inflammation

2 Hyperesthesia of the skin and soft parts which was unusually marked extended far beyond the periosteal focus, and was manifested at the slightest touch of the hair-pencil or the finger tip without any pressure on the deeper tissue

The author regards the hyperesthesia as a clinical analogue to Head's zones in disease of the internal organs, but it is more widespread and extension does not occur necessarily by segments or by nerve roots It can be explained as due to radiation of the sensation of pain from the nervous region of the periosteum to that of the skin and soft parts by an indirect route through the spinal centers Polyneuritis and associated inflammatory involvement of the skin and soft parts can be excluded Spontaneous pain of a dull boring character may also be present There is further an extreme power of reaction of the subcutaneous cellular tissue in the form of widespread infiltration and later of slow formation of hard callus to subcuta

tendency to progress Numerous drugs (acriflavine silver salvarsan colloid preparations of silver urotropin, etc) have no effect upon it Hydrotherapy with mud baths fango packs and treatment with radiant heat are of value to alleviate the symptoms Minimum doses of X ray treatment have been found beneficial When the disease is circumscribed surgical intervention appears to be indicated and should be radical

As a term for the new disease the author suggests polyperiostitis hyperæsthetica" Sorrentino (Z)

Young, J K., and Cooperman, M B.: Von Recklinghausen's Disease or Osteitis Fibrosa. *Ann Surg* 1922 lxv 171

with vicious union extreme muscular atrophy and severe deformities of the pelvis and spine The

glands, faulty calcium metabolism, and low grade chronic infections seem to be of etiological importance

curs particularly in the evening and at the time of the formation of new periosteal foci

In the first two cases which were observed over a long period, the disease extended, with interruptions in its progress throughout the entire skeleton

The author refuses to accept tuberculosis syphilis, infectious rheumatism, or polydermatomycosis as the cause The exciting factor is still to be discovered as the disease cannot be brought into line with those due to known excitants The cases are too few to warrant deductions as to the prognosis, but the affection appears to be chronic and has a

ment directed toward the underlying constitutional disturbance If the lesion be accessible curettage and bone transplantation may be employed The X-ray and radium have been used in these cases with some success. PHILIP LAWIS M D

Kisch, E.: Errors of Diagnosis in Tuberculosis of the Bones and Joints (Fehldiagnosen bei Knochen- und Gelenktuberkulose) *Arch f klin Chir* 1921 cxvii 481

The author calls attention to the extraordinary frequency of incorrect diagnosis in tuberculosis of the bones and joints. The radiation of the pain is often an important factor Cases of tuberculosis of

the knee are treated for a long time as cases of flat foot. A painful knee joint is treated for a long period with massage and hot air when the real trouble is tuberculosis of the hip

In the differential diagnosis of tuberculous arthritis the chief diseases to be considered are gonorrhœa, lues and rheumatism The principal clinical difference between gonorrhœa and tuberculosis is the pain. Tuberculosis of the wrist knee elbow or shoulder which is gradual in onset is usually not very painful, but in tuberculosis of the knee and hip there may be considerable pain In gonorrhœal arthritis pain develops early and is severe. The onset of a gonorrhœal joint metastasis is sudden The day when the disease appeared is usually given with exactness In tuberculosis the roentgen picture shows atrophy and the structure of the bony trabeculæ is particularly distinct while in gonorrhœa the bone picture is less distinct

In lues of the joints the chief forms to be considered are the synovial forms. If the lesions are congenital there is almost always bilateral joint involvement Bilateral joint disease in a child is usually luetic. Acquired lues of the joints can be easily confused with a fungus or hydrops tuberculosis because a chronic course, swelling of the capsule and progressive contraction, particularly of the knee joint, are common to both The fluid obtained by puncture of a tuberculous joint in contrast to that obtained from syphilitic joint is very flocculent

the roentgen picture, is the decisive factor It is important to remember that disease of the sternoclavicular joint is very frequently luetic also that tuberculous spina ventosa like lues often begins with a slight periostitis. In such cases the diagnosis is often decided by the presence of tuberculous or luetic foci in other areas

In the joint affected by chronic rheumatism and

rigor while tuberculous osteomyelitis as a rule runs a chronic course without any rise of temperature Osteomyelitis is accompanied by pain inflammation and loss of function. In tuberculous disease of the bone marrow these are absent. In the latter there are usually other tuberculous foci in the bones. As a

because the condition is particularly rapid in its involvement of the surrounding tissues The X ray

shows however that in tuberculosis there is atrophy of the cortex. It shows also that the sequestrum of tuberculosis is considerably smaller than that of osteomyelitis its margins are finely serrated it is of a rounded, very delicate structure and it usually presents the same degree of atrophy as the surrounding bone The sequestrum of osteomyelitis is usually large long spear shaped and without atrophy In these cases also animal inoculation with the pus is decisive The differential diagnosis is of great practical importance as a cure of tuberculous osteomyelitis is effected with great certainty by means of heliotherapy or treatment with iodine

Kuettner distinguishes tuberculous arising primarily in the marrow of the diaphysis from that which involves the marrow canal secondarily to disease of the joint or foci in the spongiosa With regard to Bier's treatment of tuberculosis this division is of secondary importance

The article is very well illustrated and contains a description of tuberculous of the shaft in which particularly in reference to Bier s treatment the author discusses the processes of healing as they appear clinically and in the roentgen picture.

The differential diagnosis between osteitis fibrosa and the honeycomb form of tuberculosis of the shaft is also interesting Involvement of the soft parts or an abscess shadow indicates that the lesion is tuberculous The differential diagnosis between tuberculous coxitis and Perthes disease may often be made from the clinical examination Limping is caused by both conditions In Perthes disease limitation of abduction of the hip with normal flexion is characteristic. In tuberculosis of the hip there is limitation of motion in all directions. In Perthes disease pain is frequently absent In coxitis it is usually present. The injection of tuberculin may be of value. KOCH (Z)

Hartman, F W Synovial Membrane Tumors of Joints. Surg Gynec & Obst 1922 xxxv 161

Synovial membrane tumors of tendon sheaths are easily recognized but their pathology is very puzzling as is evident from the variety of terms applied to them granuloma, myeloma myeloid tumor myeloxanthoma, myeloid endothelioma fibro-angioma giant-celled tumor giant-celled xanthosarcoma and benign xanthic extraperiosteal tumor of the extremities containing foreign body giant cells

The tumor growths in joints are readily classified into three groups (1) pedunculated tumors, (2) diffuse tumors with giant cells, and (3) diffuse tumors without giant cells

and cuts showing cross-sections and gross sections of some of the tumors removed

Hartman s discussion is as follows

The occurrence of these tumors in joints and especially in the knee joint raises at once the problem of saving the limb and the function of the joint

Their development is slow as a rule and ample warning is always given in the form of pain, swelling and interference with function They are readily removed if attacked in the early pedunculated stage without danger of local recurrence or remote metastases

"As to classification, it seems best to place them with the benign tumors of connective tissue origin

coma, at least until evidences of malignancy are seen either clinically or pathologically Since any one of the characteristic cells namely xanthoma or foam cells, pigmented cells, and giant cells may be absent from an otherwise typical case the writer prefers the name used by Woodhead, myeloid tumor F W CARPENTER, M D

Burke, G. T : A Case of Gumma of the Vertebræ. *Med Press* 1922 n s cxiii, 113

A Sepoy 23 years old was admitted to the hos-

The spinal movements were normal The generalized hypotonicity of the spine combined with localized stiffness, which has been so much emphasized by some observers as pathognomonic of luetic involvement of the vertebræ was not noted Absence of systemic nerve involvement in bone syphilis, as stressed by Abrams, Wile, and others, was borne out by the absence of cranial nerve involvement and of Argyll-Robertson pupils

treatment was given intravenously and by the Swift Ellis method was followed by marked relief and the return of sphincter control This improvement was only temporary however for cystitis soon developed and death ensued four months after the date of the patient's admission to the hospital

Autopsy revealed a swelling the size of a golf ball on either side of the body of the eighth dorsal vertebra and containing ½ oz of pus and cheesy material. The body of the vertebra was eroded anteriorly and laterally and through a small opening the caseous tumor communicated with the spinal canal The meninges at this level were thickened with granulated tissue ⅛ in thick Pathologic examination of the tumor around the cord demonstrated the structure of a gumma A microscopic examination of the cord section was not made

This case is of particular interest because of the location of the gumma The vast majority involve the cervical region

The statistics as to the incidence of gummata of the vertebræ vary greatly ranging from 3 per cent of cases of syphilis chosen at random in a medical clinic by Baldwin to the sparse single cases scattered throughout the literature DAVID TALBOT, M D

Eaves and Campiche Note on a Malformation of the Carpus. *J Bone & Joint Surg* 1922 iv 78

The authors report a case of congenital deformity of both wrists as follows

The patient's left hand is rather small and the fifth finger is curved toward the radius All the movements of the wrist are very extensive. Especially radius is absent

In the right hand there is a marked prominence of the base of the first metatarsal toward the volar surface and the muscles of the thenar eminence are quite thin The thumb is small and markedly curved, its concavity being toward the ulna The right index finger is similarly curved The fifth finger shows a curve with its concavity toward the radius The lateral movement of the wrist toward the radial side is very extensive The X ray of the right wrist shows total absence of the navicular bone and poor development of the styloid process of the radius

The patient has also a mild hypospadias and an abnormal growth of hair The radial pulse is in the middle of the wrist on both sides

As a rule carpal deformity is associated with severe malformations of the hand or forearm

WILLIAM A CLARK, M. D

Dupont F : Old Coxofemoral Arthritis Probably of Typhoid Origin (Ancienne arthrite coxo-fémorale probablement d'origine typhoïdique) *Rev d'orthop* 1922 xvi, 61

BRENNAN.

Maragliano D : The Treatment of Contractures of the Knee Due to Arthritis by Partial Infiltration of the Sciatic Nerve with Alcohol (Il trattamento delle contratture artrogene del ginocchio coll'alcoolizzazione parziale dello sciatico) *Chir d organi di movimento* 1921 v 659

Maragliano treats exclusively of contractures of the knee in flexion which are due to inflammatory processes and in which a certain mobility persists in that it is possible to increase the flexion already present to a greater or less degree. Generally a tenotomy or tendon lengthening eliminates the muscular contraction but in some cases contraction is re-established by cicatricial adhesions of the tendon stumps

It seems to Maragliano therefore more logical to supplement the corrective procedures by some direct action on the innervation of the flexors in order to decrease the centripetal stimulus and the energy of contraction. Such direct action may be obtained by partial infiltration of the sciatic nerve with alcohol

The injection cannot be made into the principal trunk of the sciatic nerve as in such case the alcohol might diffuse in the different fasciæ and cause permanent paralysis of muscles of the leg with resulting deviation of the foot

Maragliano states that at the level of the lower margin of the gluteus maximus the nerve fibers going to the head of the biceps the semitendinosus and semimembranosus muscles and the dorsal portion of the adductor magnus are united by a common

referred to has its own sheath

The use of alcohol to eliminate a condition of hyperkinesis in a group of muscles is not new Sicard and Imbert employed it with good results in the treatment of muscular contractions due to war wounds and it has been used also by others

Sixty per cent alcohol is best. In this concentration it interrupts the sensory conductivity of the nerve without altering its motor conductivity In two clinical cases reported by the author which resisted the usual treatment good and lasting results were obtained by this method W A Brendan

Hicks, E. P : Hereditary Perforating Ulcer of the Foot. *Lancet* 1922 ccii 319

The signs
foot appear
The first sig
soon changes to an ulcer The ulcer heals under ordinary treatment but soon re-appears. At first there is no pain but as the disease spreads and progresses the pain becomes very severe. Besides local pain there are darting pains in different parts of the body The outstanding feature other than ulcer formation is deafness which appears in the later stages The disease is progressive and shortens life In all the author's cases there was a distinct hereditary history of such a condition Practically all of the reflexes of the lower extremity were gone and there was absence of sensation to heat and cold over a large area of the foot and leg

The conclusions drawn are as follows

1 The disease is distinctively hereditary Its main symptoms are perforating ulcer of the feet shooting pains in various parts of the body and deafness

2 It is progressive and shortens life

3 It corresponds to no disease previously described but bears some resemblance to syringomyelia. F W Carruthers, M D

FRACTURES AND DISLOCATIONS

Kreuscher P H : The Management of Fractures Near Joints. *Illinois M J* 1922 xli 88

The author states that emphasis should be placed upon the fact that too long fixation is often the cause of non union and that traction should be applied, and all reductions and fixations should be effected under the control of the fluoroscope Aspiration is indicated when there has been bleeding into a joint as it favors fixation If infection has occurred the frequent injection of 2 per cent each of apotheine and formalin in glycerine is advisable, the former to prevent pain If the blood has become clotted the joint must be opened and the clot removed mechanically

Ninety five per cent of fractures of the humerus involving the shoulder joint require open reduction and fixation Because of the possibility of infection such operative procedures should be delayed until the tenth day A strict Murphy Lane technique is of importance Kreuscher advises fixation by means of a metal splint such as the Lane plate and staples He mentions also the Smith bone clamp

Bone grafting in the vicinity of joints and in the shafts of the bones is never indicated unless it is evident that normal healing will not occur

Most elbow fractures can be reduced with the aid of the fluoroscope. If misplacement has occurred however open reduction and fixation by means of screws nails, or pegs are necessary In fractures of the internal condyle early manipulation is inadvisable as it has a tendency to promote callus formation and troublesome exostoses.

With regard to fractures of the neck of the femur the author states that good results have been obtained by the Whitman method of extreme abduction but he, himself uses Murphy's method Except in cases of impaction, the patient is placed in a Travois abduction splint with Buck's extension of from 10 to 15 lbs. on the affected limb This is done on the day of the accident or as soon thereafter as possible It relieves pain prevents absorption due to involuntary muscular contraction and places the fractured bone ends in the best position.

interposed is removed. The fractured ends having been approximated, a long screw or nail may be driven into the head through the greater trochanter and the neck in such a way as completely to fix the fragments. Some surgeons use the bone transplant driven through an opening made through the neck into the head, but in Kreuscher's opinion this is superfluous and hazardous unless one is reasonably *sure that regeneration would not take place by* natural processes. Because of the decrease in the blood supply and because of conditions favoring absorption of the neck, it is necessary to immobilize in the abducted position considerably longer than in other fractures about the joints.

Traumatic arthritis may involve joints distant from the site of fracture. As a means of relieving such conditions Kreuscher suggests early traction.

James Dunlop, M.D.

Nutter, J. A.: On Delayed and Non-Union of Fractures. *J. Bone & Joint Surg.* 1922, iv, 104.

Speaking broadly, a time limit of six to twelve months may be placed on delayed union. After this, if the fracture has not united the case may be considered as a case of non-union. Statistics of various authors indicate that the incidence of non-union is 2 or 3 per cent. Certain bones seem to have a predisposition to delayed and non-union, e.g. the humerus between the middle and upper thirds, the femur in the middle third and the neck, and the tibia and fibula in their lower thirds.

A substantial proportion of cases of delayed union and non-union seen at Buxton Hospital were *found to be syphilitic and responded to anti-luetic* treatment. In some of these cases this disease acted locally producing gummatous deposits, but general experience indicates that its influence on fractures is systemic. Numerous febrile diseases, cachexia, nephritis, tabes, and diseases of the ductless glands have been regarded as causes of non-union, but their importance is theoretical rather than practical.

non-union but may delay consolidation. Interposition of soft tissues and incomplete immobilization are quite frequent causes. Sepsis, if virulent enough to cause bone necrosis and sequestration, may delay union, but mild infections tend to stimulate rather than hinder callus formation. In some cases the only apparent reason for non-union is extreme density of the bone, e.g. after osteotomy done with a saw for bowlegs. The use of metallic plates and time required for the union of bone. Non-union is to be diagnosed only after six to twelve months of unsuccessful effort to obtain union.

The treatment of delayed union is ordinarily conservative. Non-union requires operation. If delayed and non-union are to be prevented bones with recently healed fractures, especially weight-bearing bones, must not be put to work too soon; *splints must not be removed too early*, and the surgeon must not be too eager to examine or test the fracture. If a case of simple fracture of the three months' conservative treatment should be begun. The percussion and damming treatment with Bier's hyperemia originated by Thomas is an old and reliable method. Baking, massage and baths in running aerated hot water cause an active hyperemia and encourage callus formation. The injection of iodine, alcohol and other irritants may promote the growth of fibrous tissue but is of no

osteoblasts, thus stimulating new bone formation. The physiological stimulus of function hastens union, especially in the lower limbs.

For non-union in aseptic cases with loss of substance bone grafting is the method of choice to bridge the gap. If there is no gap the operation should be as simple as possible. After preliminary *direct skeletal traction for overriding*, the bone ends should be exposed, the fracture surfaces freshened, and sclerosed bone drilled. Absorbable material should be used for fixation. In ununited fractures of the femoral neck, which occur in about 80 per cent of cases, a bone peg is to be preferred to a metal spike. The peg should be left rough in order that the maximum number of osteoblasts may be preserved, and its periosteum should be removed so that there will be no barrier between the graft and the host bone. Bone grafting seems to be more successful in the larger bones than in the smaller ones, such as the radius and ulna, probably because of the proportion of the trauma to the size of the bone. The method of choice for tapered bone ends consists in splitting them and engaging the graft between the split ends.

Sepsis is not, as formerly supposed, a cause of non-union. War experience showed that abundant callus forms in the presence of pus and that if the fragments are in apposition union takes place readily. Pus is a contra-indication, however, to internal fixation of any kind. To avoid encounter

ing latent infection in old ununited fractures, six to twelve months should be allowed to elapse after healing before a fixation operation is undertaken Even then it is best to do the work in two stages In the first stage the bone fragments should be exposed and the bed prepared for the graft. After ten days, if no infection has resulted the graft may be inserted and the wound closed

A comprehensive bibliography supplements this article. WILLIAM A CLARK, M.D

Wilmoth P Congenital Dislocation of the Shoulder — Congenital Malformation of the Shoulder (La luxation congénitale de l'épaule — malformation congénitale de l'épaule) *Rev d'orthop* 1921 32. viii 617

The scapulohumeral articulation may be congenitally malformed In such cases dislocation of the humeral head may occur in a perfectly normal labor without trauma.

A similar clinical picture is presented by obstetrical paralysis due to trauma In this group of cases the brachial plexus may be involved in its entirety or in only its upper or lower portion. Each lesion g

igenitally dis-
l nction is not completely lost and internal rotation of the humerus is not exaggerated good results may be obtained from massage electrical treatment, and mobilization. In other cases osteotomy is indicated

LOYAL E DAVIS, M.D

Schaefer H : The Effect of Rotation Movements upon the Total Function of the Elbow Joint and Its Importance in the Treatment of Fractures (Ueber den Einfluss der Rotationsbewegungen auf die Gesamtfunktion des Ellenbogengelenks und ihre Bedeutung fuer die Frakturbehandlung) *Arch f orthop u Unfallchir* 1921 xx 22

The author discusses the action of the individual muscles of the forearm upon motion at the elbow joint. The change in function of the individual muscles resulting from different positions of the joint corresponds to a disturbance of the innervation of both main groups of extensors and supinators viz. the radial nerve and the flexors and pronators the musculo-cutaneous median and ulnar nerves.

The mechanism of the joint shows also the interdependence of the partial joints since rotation movements are accompanied by movements of flexion and extension and flexion and extension movements are accompanied by movements of rotation Rotation movements can therefore maintain the capsule and the flexor and extensor muscles in function to a certain degree even when the elbow joint is fixed For this reason rotation movements should be made from the very beginning in cases of fracture of the elbow dressings should be carried up only to the middle of the arm, and the flexed position should be changed every six days

HELLER (Z)

Bizarro A H : A Comparative Analysis of 213 Forearm and Leg Fractures. *Ann Surg* 1922 lxxv 221

In reviewing 105 forearm fractures the author found that the most common causes were the back firing of motors and falls and that approximately 75 per cent of such fractures occurred between the ages of 10 and 30 years

The radius alone was broken in seventy four cases the radius and ulna in sixteen and the ulna alone in fifteen cases

Of the single radial fractures fifty six of the seventy four were fractures of the lower half of the bone The lower half of the lower third of the radius is the point least resistant to trauma. The transverse fractures are most common oblique fractures next most common and longitudinal cracks least common The majority of the fractures are complete The incomplete or green-stick fractures are more common at the upper half of the lower third

Of the fifteen single ulnar fractures six were in

therefore the most common point of fracture In three cases the olecranon fracture was incomplete The tip of the ulnar styloid was broken in 13 per cent of the single fractures of the ulna and the radial styloid in 5 per cent of the single fractures of the radius

Of the sixteen fractures of the radius and ulna 60 per cent occurred in the lower third of the bones

The lower end of the radius is the most common site of chauffeur's fracture the lower epiphyseo-diaphyseal line being the most common level. It is difficult to explain why in some of these cases only one bone was broken while in others both were fractured The factor responsible appears to have been the position and amount of wrist abduction at the time of the back firing

There were four cases of epiphyseal separation due to back firing and two due to falls on the hand The swelling was diffuse and there was an ecchymosis at the front or the back of the wrist

There were four cases of reversed Colles or Goyrand fracture two of which were due to back firing and two due to falls on the hand with the wrist flexed

In the cases reviewed there were only three classic Colles fractures. One of these required forcible wrenching to reduce the impacted fragments

Fractures of the bones of the leg occurred in 118 cases Twenty five were due to slipping or to twisting or sprraining of the ankle, twenty-one to falls and the remainder to various injuries received du
du

four (80 per cent) were in the lower two-thirds of the lower third three were in the upper third of the lower third four were in the middle third and one was in the upper third The direction of the frac

ture was usually oblique although at the distal end of the bone the transverse fracture is more common

third (malleolar) eight in the upper third of the lower third, two in the middle third and four in the upper third (two of the tubercle and two of the outer tuberosity)

There were fifty-two cases of fracture involving both the tibia and fibula The lower tibial third was fractured in 88 per cent of these cases The upper half of the lower third of the tibia appears to be the most fragile part of the bone Almost one half of the fractures at this level were of the spiral type.

Summarizing the series of tibial and fibular fractures it is seen that fracture of both bones was more

Classic Pott's and Dupuytren's fractures were comparatively rare in this series

DANIEL H LEVINTHAL, M D

Kra

Kraus reports a case of congenital forward luxation of the head of the left radius of a girl 10 years of age. The diagnosis was made after examination of successive roentgenograms

Such an anomaly is not rare as 118 cases have been reported in the literature and in somewhat

per cent of the subjects were males.

In the author's case examination of the roentgenograms shows alteration in the radio-ulnar interosseous membrane, increased laxity structural deformities in the radio-ulnar and humeroradial ligaments, and over-development of the radial tubercle which is raised so as to form a triangle with an apex of about 145 degrees This over-development of the tubercle has not been reported previously The radius is somewhat longer than normal

W A BRENNAN

Cohen, I Dislocation of the Pisiform *Ann Surg* 1922 lxxv 238

The author reports the case of a boy 11 years old, who fell and struck his left hand suffering a backward displacement of the lower epiphysis of the radius and a forward and slightly upward displacement of the pisiform bone

On examination, the pisiform bone could be palpated at a higher level than normal and was dis-

pisiform was in place Ten days later passive motion was begun At this time the pisiform was less moveable than at the previous examination, but

either a direct blow or muscular violence

DANIEL H LEVINTHAL, M D

Froelich: The End-Results of the Treatment of Congenital Dislocation of the Hip by Non Operative Reduction (Les résultats éloignés dans le traitement des luxations congénitales de la hanche par la réduction non sanglante) *Rev d'or thop* 1921 32 VIII 451

Froelich reports a series of ninety-eight cases of congenital dislocation of the hip ten years after non-operative reduction In 75 per cent of these cases reduction was perfectly maintained Roentgenograms were used to check these findings Until puberty the X ray may show changes in the femoral head and neck suggesting a true coxa vara At the time of puberty transitory pain or slight contractures may occur in the affected hip At this time also a painful arthritis may develop with superficial destruction of the femoral head The latter condition is probably due to tuberculosis

Of seventeen other cases operated upon ten or more years previously one-third showed a perfect anatomical and functional result In some cases with a perfect functional result however there were changes in the head or the neck of the femur such as thickening, depression, and coxa vara

The author favors a simple method of treatment After reduction he maintains the limb in a position of abduction and flexion for four months by means of a plaster cast The same position is then kept for one month without the aid of a cast Finally after a roentgenographic examination, walking is begun at the sixth month and the patient's activity is gradually increased LOYAL F DAVIS, M D

Garnotti, L G The Hahn-Codivilla Bone Graft (Contributo allo studio del trapianto osseo alla Hahn-Codivilla) *Policlin* Rome, 1921 xviii sez. chir 548

the lower tibial stump Codivilla performed the entire operation in one stage

In a case of pseudarthrosis of the left tibia due to a gunshot injury the author cut a section of the fibula 16 cm long, inserted its upper part into the medulla of the proximal stump of the tibia and fixed its distal end to the lower stump by means of a metal strip

Seventy days later the X ray showed that the graf
part
end
was not evident At the end of one hundred and fifty days it was found that the graft had been broken in the center, but the fragments were well approximated At the end of two hundred days a callus of considerable thickness surrounded the area of fracture but absorption at the site of the metal band was very marked

At the end of two hundred and seventy days the fracture was well consolidated by a strong callus and at this point the graft had grown considerably in volume An operation was then done to remove the metallic strip which appeared to hinder union and the patient left the hospital. A year after the original operation the X-ray showed that the fibular graft had increased in diameter but deep atrophy had caused a second fracture at the former site of the
the

tion the tibia was practically normal and it was no longer possible to determine the line of demarcation between the two tibial stumps or any trace of the two fractures

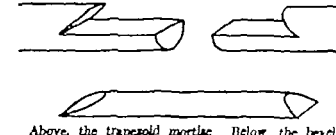
Moreau J : The Swallow Tail Bone Graft (*La greffe osseuse "en queue d'aronde"*) *Arch franco-belges de chir* 1921 xxv 156

In the method described by Moreau the graft is cut in the shape of a trapezoid its two ends being bevelled off The ends of the bone to receive the graft are then prepared in a reverse way so that the graft fits exactly This method of fitting a trapezoidal piece in a mortise is known in carpentry as the swallow tail or dove-tail method The graft and bone ends are tied with a loop of chromic catgut

og
tic

1 Swallow tail bone grafts are to be recommended because they penetrate and are encased by healthy bone tissue and they are in contact with a large surface of the bone to which they are grafted

2 The method of fixing such grafts in position prevents any interruption of contact with the fragments renders the use of metallic fixation unnecessary holds the fragments in their proper position, and prevents deformity when union takes place The diaphyses are restored to their primary position.



Above, the trapezoid mortise Below the bevelled graft

3 This method of bone grafting is indicated particularly in cases of pseudarthroses and loss of substance in the bones of the forearm.

W A BRENNAN

SURGERY OF THE BONES JOINTS MUSCLES TENDONS, ETC.

Klapp B : The Present Status of Surgery of the Joints (Ueberblick ueber den gegenwaertigen Stand der Gelenkchirurgie) *Beri klin Wchnschr* 1922 lviii, 1317

Klapp discusses in detail the antiseptics which have been used with good results during and since the war He agrees with Bier that tuberculosis of the joints should be treated not only by surgery but also by heliotherapy or the induction of hyperæmia and injections of sodium iodide It is now seldom necessary to amputate for tuberculosis of the joints.

Operative mobilization of stiff joints and plastic surgery of the joints are touched upon, including methods developed within the last few years by which excellent results have been achieved according to the reports of Wolff Helferich Payr Lexer and others The statement is made that arthritis deformans is a condition very well suited for operative mobilization.

In conclusion the author discusses fracture of the neck of the femur and its surgical treatment In certain cases when the disability is severe it is necessary to extirpate the head in order to place the shaft in the acetabulum so that walking will be possible CARLTON (Z)

Pascalis, G : The Operative Treatment of Cases
I

The author describes an operative method consisting in elongation of the biceps to relieve immobilization of the elbow caused by muscular con
generally
in the
expan
sion detached from the internal border of this tendon which becomes fused with the antebrachial aponeurosis On close observation however condition appear somewhat different The aponeurotic expansion is not detached from the internal edge of the principal tendon but is a true accessory tendon

to which the superficial fibers of the muscular body are attached This accessory tendon immediately subjacent to the principal tendon, spreads out fan wise and is attached to the superior crest of the ulna It is well fused with the antebrachial aponeu rosis but keeps its anatomical individuality Evi dently it is to this tendon that the muscle owes its power of supination

The author's operation consists in sectioning the two tendons and suturing them end to-end thus obtaining correction of the faulty attitude of the arm The tendons are isolated, the accessory tendon is sectioned at its lowest part the principal tendon is sectioned at the point where it is united to the muscle, and the accessory tendon is slightly twisted on its axis and sutured at its distal extremity to the proximal extremity of the principal tendon If necessary an elongation of 5 or 6 cm may be ob tained W A Bridgman

Pier

535

In Pieri's opinion the stump formed by the tech nique devised by Dalla Vedova in 1913 best fulfills the three conditions regarded by Codivilla as essen tial in an amputation stump of the lower limb and

ments

The Dalla Vedova stump may be considered a partially cinematic stump because plastic motors are formed in the flexor-extensor loop and there is a free smooth cap or lid on the end of the femur which closes the surface of the bone section The branches

his method of stump formation comprises a curvilin ear incision made on the anterior surface of the knee beginning on the posterior margin of the con dyle and descending to the anterior tuberosity of the tibia The end of this incision is united on the posterior surface of the knee to a second incision

knee the crossed ligaments and the meniscus are left attached to the tibial epiphysis In the inferior

teal hinge being left Thus bone shell is then drawn

cm under the line of the cutaneous incision Fol lowing their exposure the vessels are cut between ligatures and the nerves are cut as high as possible. The remaining soft parts uniting the leg and thigh are then severed

The flexor tendons are sutured to the patellar ten don the flexors being shortened and sutured under tension The skin is sutured after the insertion of drains

This osteoplastic operation was performed by Pieri on two soldiers who had had an amputation some distance below the knee In a third case it was done for gangrene of the leg following an injury In two other cases of amputation it was modified by the formation of a cutaneous tunnel and plastic muscle motors for cinematization The end results were satisfactory The soft parts covering the bone stump were quite elastic The cutaneous tunnels through which the prosthetic apparatus was at tached in the cinematic procedure were formed in much the same way as in other cinematic stump operations W A Bridgman

Tavernier L.: Operative Treatment of Ankylosis of the Knee Joint (Traitement opératoire des ankylo ses du genou) *Rev d'orthop* 1921 32 in, 577

Operative interference in ankylosis of the knee attempts to obtain ankylosis in a better position or to re-establish movement in the joint

Limitation of extension due to popliteal cicatrices or retraction of the flexor tendons is not true ankylosis

When correction of position alone is desired and when the ankylosis is slight osteotomy or osteoclasis are both of value but when the flexion deformity exceeds 135 degrees the advantages of osteotomy are apparent In flexion deformities of 90 degrees, trochlear resections, progressive reduction, and popliteal tenotomy constitute the best treatment

To re-establish mobility in an ankylosed knee

articular surfaces in a position as nearly normal as possible and the interposition of tissue to maintain the mobility in the articulation Pedicled flaps of muscle aponeurosis, and subcutaneous fat fascia lata and amniotic membrane have all been inter posed with varying success Schepelmann believes that the separation of the articular surfaces by trac tion and early mobilization are of far greater value than the interposition of a flap

Although complete hæmostasis is obtained ultimately, the operation is a tedious one. The author believes that the disadvantage that it is impossible to lengthen the quadriceps tendon particularly in old ankyloses. Putti however has recommended an incision anterior to and below the patella and continued laterally by two incisions encircling the bone.

The author believes the resection of periarticular fibrous tissue is a very important step in the operation. It is generally agreed that after the operation traction is indicated to separate the bony surfaces and prevent dangerous compression upon the interposed tissue. The time at which movement is begun and the amount of energy used in the movement are factors of great practical importance.

The author agrees with Murphy that the unsuccessful results of arthroplasty are due to the operative technique or poor postoperative treatment. The results of articular grafting are not brilliant and the indications for this treatment extremely limited.

The unfavorable conditions for arthroplasty are, in the order of their importance: bony ankylosis involvement of the patella in the ankylosis; muscular atrophy; a tuberculous origin of the ankylosis and absence of the patella. The latter three conditions may be considered relative contra indications.

LOYAL E. DAVIS M D

Wotschack The Cause of Spontaneous Rupture [illegible] 1921 [illegible]

Only seven cases of direct rupture of the quadriceps muscle are reported in the literature. The mechanism of the rupture is the same as that of tears of other muscles and tendons. Indirect causes include a fall on the patella, muscular contraction made in falling and disease of the muscle. Fairly large bony and cartilaginous bodies indicating a dissecting process in the bone have been found relatively frequently in the torn-off quadriceps tendon.

Wotschack reports a case in which the disease process is seen in an early stage that is the bony piece is not yet entirely separated and consequently is not torn out with the tendon. A lateral view in the [illegible] quadriceps muscle appears imminent.

PLENZ (Z)

SURGERY OF THE SPINAL COLUMN AND CORD

Sauerbruch F: The Surgical Treatment of Severe Scolioses (Ueberlegungen zur operativen Behandlungen schwerer Skoliosen) *Arch. f. klin. Chir.* 1921 cxvii 550.

In fibroid phthisis there is always a deflection of the spinal column toward the normal side. Following paravertebral resection of the ribs the spinal column bends slowly back, its vertex coming back close to the median line. In many cases an over-correction is reached. Drawing together of the ribs and relaxation of their tendon determine the shape of the spinal column.

Sauerbruch and Lange together operated on a patient with a high-grade fixed scoliosis. All the ribs on the concave side were to be resected near the vertebræ. In order not to place too great a strain upon the patient, only the three lower ribs were resected in the first stage of the operation. These are the most difficult to resect because from the ninth rib downward the vertebral segments disappear under the dorsal musculature. After the wound was completely healed gymnastics were begun. The condition improved during the first few days but later remained stationary.

Three months later at a second operation, the first seven ribs were resected (4 to 5 cm from each, as at the first operation). No improvement could be determined as a direct result of the second operation either in the habitual posture or in mobility. After healing of the wound gymnastic treatment was again given. Gradually the body was drawn over more from the right convex side to the left concave side and the patient became able with an effort to assume an erect position.

To reproduce the enormous effect of the approximation of the ribs on the concave side Sauerbruch's assistant Frey proposed a sort of gathering up of the ribs on the convex side. In animal experiments it was found that this operation had very good results particularly when the ribs on the concave side had been resected previously. Sauerbruch used this method in the case of an 18-year-old girl. He first resected all the ribs on the concave side and then drew the third to the seventh ribs on the convex side very tightly together by means of copper wire. The result was so surprising that at the time the dressings were first changed the spine might have been called straight. Unfortunately however the wires cut through the ribs and one was expelled as a foreign body.

Acting on a second proposal of Frey, Sauerbruch operated on a 17 year-old boy with severe rachitic fixed right-sided dorsal scoliosis. The operation was performed in two stages. In the first stage a section 3 cm. long was resected from the second to the ninth ribs on the concave side and in the second stage a similar resection was done on the second to the eighth ribs on the convex side. The effect on the heart and lung action was remarkably slight. A plaster of Paris dressing was applied in extension with slight pressure on the scoliotic convexity of the chest. Eight days after the removal

of the plaster of Paris the scoliotic convexity of the chest had nearly disappeared and the scoliotic curvature of the spine had become considerably flatter Porr (Z)

The authors case was that of a man aged 45 years who was run over by an automobile The X-ray showed (1) right anterolateral luxation of the third lumbar vertebra which was more marked in its anterior portion (4) fracture of the transverse processes of the second and third lumbar vertebrae on the left side, opposite the lateral luxation of the body of the second lumbar vertebra

The authors attempted to determine the mechanism of these injuries by studies on cadavers and skeletons but they were unable to arrive at any entirely satisfactory conclusion They are inclined to the belief however that torsion combined with lateral flexion was an important factor

The luxation was easily reduced by operation after suspension and traction had failed

W A Brennan

Kleinberg: Fractures of the Spine. *J Bone & Joint Surg* 19 2 IV 80

In a great many cases of fracture of the spine with a definite history the presence of deformity and localized pain, the diagnosis is quite easy In fresh cases, however the early recognition of the true condition is often difficult, especially in industrial injuries

Following direct or indirect violence causing vertebral fracture there is localized and persistent pain which varies in degree This may be so mild that the patient overlooks it or so severe that morphine is necessary for its relief There may also be weakness out of proportion to the other findings. Both pain and weakness are increased with motion The pain may be referred also to the nerve distribution corresponding to the level of the lesion for example to the lower abdomen when the lesion is in the lower dorsal spine and to the lower limbs when the lesion is in the lumbar region Paralysis of the legs and loss of sphincter control and sensation, indicating cord injury are suggestive of spinal or lordosis is an important sign but not always present Roentgenograms taken in two planes furnish the most convincing evidence of fracture Lateral views are best since in these the vertebral bodies are not obscured by the spinous and transverse processes, the laminæ and pedicles While the patient is lying on his side the intestines should be pushed toward the front of the abdominal wall (into the flank)

The prognosis as to life may be said to be good if intercurrent affections are not considered. Death may result indirectly from gradual exhaustion due to paralysis and trophic lesions The repair of the fracture itself is slow the callus formation being much less around a fractured vertebra than that

produces The usual fracture of one vertebra produces stiffening of only one or two joints, while a bone graft for internal splinting must extend over at least six vertebræ This disadvantage is minimal in the dorsal region where normally very little flexion is required When the radical operative

without waiting a few days to observe the effects of rest and efficient support From the symptoms alone it is impossible to tell the pathology of the lesion The roentgenogram is not an index of the degree of the cord injury since in some cases with severe crushing fractures and displacement of fragments there are no cord symptoms If laminectomy is definitely indicated a delay of several days may allow further damage to the cord On the other hand, expectancy may be rewarded by the spontaneous disappearance of the paralysis if the spine is given proper support Many surgeons believe that the only safe procedure is laminectomy performed as

in mind.

Eight cases are reported which were seen by the author from one to many months after the injury

weeks of such support but was practically well eight weeks after the insertion of a bone graft

WILLIAM A CLARK, M D

Hartshorn W E.: Fracture and Dislocation of the Cervical Vertebræ without Paralysis; Report of a Case. *Boston M & S J* 1922 clxxxvi 141

In reporting a case of fracture and dislocation of cervical vertebræ without paralysis the author classifies some of the more common injuries and describes their symptoms. Broadly speaking they are of two main types those with and those without paralysis

Injuries to the spinal cord may be classed as follows

1 Concussion This may be associated with a temporary paralysis.

2 Trauma with intraneural or spinal hæmorrhages. The paralysis may persist for a considerable period in certain groups of muscles and then gradually disappear

3 Injuries to the cord from fragments of the bony framework, with resulting pressure symptoms or laceration of the cord with destruction of tissue

4 Pressure on the cord due to dislocation of the vetebræ without fracture.

5 Fracture and dislocation of the vertebræ without injury to the cord

6 Compression fractures of the bodies of the vertebræ.

JOHN DUNLOP M D

Albanese, A. Clinical and Anatomical Research on Bertolotti's Syndrome (Per la conoscenza della sindrome del Bertolotti Ricerche cliniche ed anatomiche) *Chir d organi di movimento* 1921 v 537

[illegible] syndrome

congenital anomalies of the vertebral column, especially those of the sacrolumbar region and to the nervous and vascular syndrome caused by them He demonstrated by means of the X ray that many obscure clinical conditions incorrectly considered to be sciatica or lumbago were due to an abnormal development of the lateral processes of the fifth lumbar vertebra and to the abnormal relations of this vertebra to the sacral and iliac bones Albanese describes a series of cases of such anomalies in some of which the syndrome appeared after the twentieth year of age and in others of which the lumbar sacralization was not the only deformity present.

Unilateral sacralization is not always accompanied by scoliosis or by unilateral symptoms Hypertricosis is not a constant finding In only one case could pregnancy be regarded as the cause of the symptoms

The author suggests that the anomaly may be a phenomenon of atavistic reversion

W A BRENNAN

Sicard J A, and Forestier J : Chronic Lumbar Rachialgia — Chronic Rheumatismal Lumbago; Laminectomy (Rachialgie lombaire chronique—lumbago chronique rhumatismal laminectomie) *Presse méd* Par 1922 xxx, 45

In the type of chronic rheumatismal lumbago discussed the essential characteristic is the absence of any indication of a bone lesion in the roentgenogram The condition is a rachialgia lumbago or spondylalgia rather than a lumbar arthritis or spondylitis The treatment should therefore be surgical rather than medical or physical viz a lumbar laminectomy which is curative and not dangerous.

The authors give the positive and negative characteristics which differentiate chronic lumbar rachialgia from other chronic spinal conditions of the rheumatismal type Among the positive characters are (1) stiffness localized in the lumbar spine; (2) pain which tends to be chronic is noted

sciatic region (3) muscular contraction a lumbar rigidity probably due to some peri-articular ligamentous sclerosis and evidently an antalgic attitude and (4) chronicity

Among the important negative characters are the absence of (1) any vertebral lesion discernible by the X ray (2) changes in the cerebrospinal fluid

the thigh

ommended

includes the posterior segments of three four or five vertebræ The solidity of the spinal column is never compromised by it. The authors have already reported cases in which repeated laminectomies done on the same patient in the dorsolumbar region with only two or three intervening vertebræ did not affect the solidity of the column. Laminectomy appears to be the treatment of choice in cases of lumbago and even in chronic cases of lumbar arthritis with osteophytes. The operation is beneficial and is not followed by either local or general complications

In the course of the laminectomy for these con

[illegible]

ments, a veritable transverse bridge being divided

SURGERY OF THE NERVOUS SYSTEM

Gatch, W D and Ritchey J O: Neurofibromyxoma Treated by Conservative Operation *Ann Surg* 1922 lxxv 181

Two cases of neurofibromyxoma treated by conservative operation are reported as follows

CASE 1 A tumor 2 cm in diameter which was painful and increasing in size was removed from the nerve trunks of the brachial plexus On microscopic examination the cell mass was found to be essentially fibrous and myxomatous tissue, but an occasional area in the frozen sections suggested sarcoma No nerve tissue at all was found The clinical course of the case ruled out malignancy From the clinical course and pathologic examination the tumor was classed as a false neuroma of the class neurofibromyxoma, fibrous tissue predominating

CASE 2 A tumor which increased from the size of a hen's egg to that of a goose egg in two months was situated on the brachial plexus This growth had been present for ten to twelve years and caused pain and tingling in the arm Microscopic examination following its removal showed it to be a neurofibromyxoma in which the myxomatous tissue predominated

Guides to the surgeon as to the malignancy of nerve tumors are

1 Their duration

2 Motor or sensory paralysis An infiltrating tumor produces either or both.

3 Their gross appearance (a) cystic or jelly like (b) encapsulation

4 Microscopic study

GEORGE E SORROW M D

Gos [illegible] The End Result of [illegible]

The Great War revived an interest in the use of grafts to bridge nerve lesions with a large loss of substance a subject first considered by Albert in 1876 Whenever possible however direct end to-end suture of the ends of a divided nerve is preferable to any other method

The author reports the end results of nerve

author 35 per cent gave good results 45 per cent mediocre results and 20 per cent poor results Of two heterograft operations both were failures Of thirty-one autograft operations performed by other French surgeons 30 per cent gave good results 40 per cent, mediocre result and 30 per cent poor results Of ten operations in which homografts

better than those obtained by nerve grafting Of the artificial methods of bridging nerve defect autografting is best LOUIS J DAVIS M D

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Ans [illegible]

Amaldi's patient was a man 44 years of age who presented a voluminous tumefaction bounded internally by the median line below by the bi-iliac

and exploratory puncture a diagnosis of retroperitoneal cyst was made Insufflation showed that the colon was in front of the tumor and that the latter was situated below the right kidney

Laparotomy confirmed the diagnosis The colon was intimately adherent to the cyst During the

enucleation of the cyst it ruptured flooding the peritoneal cavity with its contents The patient made an excellent recovery

peared to be formed by the fascicular layer of the

as a lymphatic cyst developing in an accessory adrenal gland These cysts were originally de

they cause oedema of the lower limbs and may affect

the ureters and bladder They are difficult to diag
.hor s
cyst
of the
tumor and the fact that the colon lay in front of it The possibility of a renal tumor was excluded because there were no urinary symptoms and the tumor was fixed Renal tumors are relatively movable

The precise nature of the cyst could be established only by histologic examination

W A Brendon

Knox L. C The Relationship of Massage to Metastasis in Malignant Tumors. *Ann Surg* 1922 lxxv 129

It has been generally assumed without direct experimental proof that a number of factors favoring the production of metastasis in malignant tumors in man are purely physical These include the size and connective tissue relations of the tumor cells, the pulsating or contractile movements of the organs in which they are implanted, the number of the blood vessels and the thickness of the blood vessel walls upon which susceptibility to trauma by pressure or massage depends On the other hand accurate clinical study and experimental work have discredited the occult and convenient theories of tissue predispositions and
- -ed it is shown that
facts do not
occurrence and
distribution of metastases vague theories should not be substituted

In animals very gentle massage for a total period of from two to five minutes distributed over a number of days, has been shown to set free numerous particles of tumor which form emboli in the lungs The formation of metastatic tumors by such emboli depends upon the growth activity of the primary growth Tumors which do not grow readily when implanted in the subcutaneous connective tissue form much fewer metastases than those of higher virulence Carcinomata and sarcomata of the compact spindle-cell variety are not influenced. Therefore the importance of avoiding diagnostic or operative manipulation of a tumor in man is obvious. C. Corbin Yancey M D

Schaaning G Implantation Metastases (Implantations-metastasen) *Norsk Mag f Lægevidensk* 1921 lxxxii, 109

Case 1 A 35 year-old woman was operated on for carcinoma of the cervix. During healing a tissue resembling granulation tissue with extensive ulceration developed in the abdominal wound. Under the microscope this tissue appeared similar to cancer of the uterus

Case 2 A 50-year-old woman was operated on for carcinoma of the fundus of the uterus. Between three and four months later carcinoma nodules developed in the abdominal scar

Case 3 The patient was a 55 year-old man with cancer of the stomach A year and a half following resection the operative scar showed infiltration which under the microscope had the appearance of gastric cancer

Case 4 A 55 year-old woman with cancer of the stomach was treated by resection Six months later ulcerating nodules appeared in the abdominal scar Microscopic examination showed carcinoma.

Case 5 The patient was a woman 57 years of age who had been operated on three years previously for hypernephroma. During the last six months there had developed in the operative scar a well-defined tumor which microscopically showed the structure of a hypernephroma.

In all these cases the incisions were made in normal tissue so that the tumor mass would not come into direct contact with the wound Therefore the secondary growths must have been due to superficial, detached cells and these must possess considerable vitality Case 5 is of particular interest because two and a half years passed before the secondary tumor became noticeable

Kortenhery (Z)

SERA, VACCINES AND FERMENTS

Stewart, T M : Autotherapy *N York M J* 1922 cxv 135

The author gives his technique and results in the use of autotherapy Autotherapy consists in the subcutaneous or intravenous injection of toxic substances obtained from sputum or aural or nasal discharges prepared with distilled water and incubated at room temperature Blood and serum are also used

Waag Carnot and Pappenheim report good results in pernicious anæmia from subcutaneous injections of the patient s own blood Strossberg obtained good results in pellagra with autoserum The author cites cures of ethmoiditis and laryngitis effected by subcutaneous injections of nasopharyngeal discharges highly diluted with normal saline to prevent anaphylaxis

Viton and Poncet give high dilutions of the patient s own blood intravenously in a great variety of cases In the same class of cases they use also minute doses of tuberculin with good results

The principle of the treatment is the action of unknown immune bodies Carol E Jamison M D

BLOOD

Buchanan J A.: The Medicolegal Application of Blood Group *J Am M Ass* 1922 lxxviii 89

The author's investigations have proved that the blood group is not a criterion in the identification or fixing of parentage.

One of the most fundamental features of Mendel s experiments was the demonstration of the heterozygous nature of plants A heterozygote presents objectively a particular character but through its

germ plasm has the capacity of transmitting the character which was evident in a previous genera

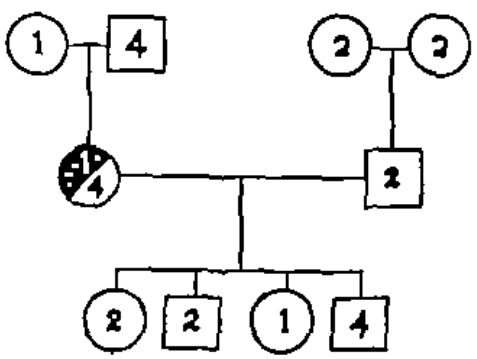
heterozygous natures of man are clearly demonstrated when both parents and at least three of the offspring are studied.

connection with human heredity To describe the hereditary characters of man the expressions "dormant and evident" are more exact.

An indispensable factor in proving the Mendelian segregation of characters is a knowledge of the

groups, however it shows distinctly that the groups in the children are limited only by the groups rep-

dent in the
panying figu
ceedings or
by this figu
criterion of legitimacy the daughter in Group I would have been held illegitimate. Moreover a grandparent might be a heterozygote and in virtue of this might transmit a character to a son or daughter who in turn might be a heterozygote.



Demonstrating possibility that Group I may appear as the dormant character and the possibilities for the miscarriage of justice if the blood group were used as a criterion of parentage

Thus the long concealed character might not appear for two or three generations.

The author concludes that it is to be hoped no court will ever utilize a means of adjusting a dispute that is surrounded by such possibilities for the miscarriage of justice

1921 cxviii 794

In view of the desperate condition of persons suffering from pernicious anaemia the authors regard as justifiable an attempt to stimulate the development of normal bone marrow by the removal of a portion of the degenerated marrow from a medullated bone They expected a vicarious appearance of erythropoiesis of the spleen as is observed in cases of destruction of the bone marrow by tumors and hoped through the bone marrow to influence the function of the spleen the failure of which brings about the same result as that caused by splenectomy

The reports of nine cases are given following a description of the technique The operation was undertaken only on patients who were severely ill In one case death occurred on the second day in another the condition was complicated by decubitus and in a third the condition became worse In the remaining six there was a very marked

mentlooning was observed in any case

A conclusive statement as to the duration of the effect exerted on pernicious anaemia by the removal of marrow from a medullated bone is as yet unwarranted Favorable effects were obtained in a series of cases NARATH (Z)

BLOOD AND LYMPH VESSELS

Montpellier J., and Lacroix, A.: A Curative Fibrosis of Varices Obtained by Local Injections of Biniodide of Mercury (Fibrose curative des varices obtenue par injections locales de bi-iodure de mercure) *Bruxelles méd* 1922 xii, 168

Sicard's method of treating varices seems to be a decided advance in therapeutics but while the injection of sodium carbonate is not difficult for

sodium carbonate

The authors have therefore sought a less irritating chemical possessing the obliterating qualities of sodium carbonate This they found in biniodide of

mercury in aqueous solutions of 1 or 2 per cent such as are commonly employed in syphilis An elastic band is placed below the varicose packets and the vein punctured with the needle of a syringe carrying 2 c. cm of the bimodide solution No inconvenience is caused by the spreading of a quantity of this solution in the paravenous tissues

The effects of such bimodide injections are in every way comparable to those of Sicard's solution. Twenty four hours after the injection small varices are transformed into hard cords with apparently no circulation. In very large varices the effect may not be observed for four days or perhaps longer The venous territory in the neighborhood of the point of injection tumefies and hardens There is neither pain nor reaction. Histologic examination of tissue removed by biopsy shows rapid obliteration of the vein and total fibrosis W A Brendan

GENERAL BACTERIAL INFECTIONS

Phemister, D B : Hæmatogenous Staphylococcus Infections Secondary to Foci in the Skin. *J Am M Ass* 1922 lxxviii 480

The chief habitat of staphylococci is the skin In most skin infections these organisms are found to be either the exciting cause or secondary invaders The most important of such skin lesions are boils and carbuncles

That skin foci are sources of hæmatogenous staphylococcus lesions is demonstrated by nineteen cases briefly summarized and grouped according to the structures involved. In all instances the staphylococcus usually the aureus type was the only organism in cultures from the pus obtained at operation The only definite focus of infection for the entrance of the organism was in the skin and in only one case two bones were involved In two cases there were multiple renal abscesses in three a perinephritic abscess was found In four there was myositis and in two arthritis

Lesions may occur in other structures such as the bursæ tendon sheaths pleuræ the pericardium and endocardium

Undoubtedly the nasopharynx is an important portal of entry for the staphylococcus but as yet little is known regarding the exact site and duration of the lesions from which the organisms gain entrance

Carl R. Stenkel, M D

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Robertson O H and Peyton R Sources of the Antibodies Developing After Repeated Transfusion *J Exper M* 1922 xxxv 141

There are several reasons for the gradual decrease in beneficial effect and the occasional injury due to the frequently repeated injection of alien blood The blood is destroyed more rapidly after repeated

Recent

tibodies

olved in

The hæmagglutination in its most marked form has been traced to iso-antibodies and the frequently associated rapid blood destruction is doubtless of similar origin The antigenic relationship between the red cells of different rabbits is so close that normal iso-agglutinins become fixed upon their elaborator's own corpuscles

As has been claimed by Klein agglutinins are present within the red cells of rabbits and are readily demonstrated in watery extracts of the dried corpuscles Whether similar agglutinins are ever present in human cells remains to be determined Morris H Kahn M D

Pawlenko W A. The Surgical Anatomy of the Splanchnic Nerve (Die chirurgische Anatomie des N splanchnicus) *Verhandl d russ chir Pirogoff-Ges* Petrograd 1921

In the author's opinion the induction of anæsthesia of the splanchnic nerve by Braun's method is of great importance To explain it he undertook an anatomical investigation. The formation and the position of the splanchnic nerves were studied from the standpoint of their relationship to age sex, and the form and size of the inferior thoracic aperture The coeliac plexus was also investigated and the most accessible portion of the splanchnic nerve for the injection of an anæsthetic was determined Pawlenko believes that an isolated anæsthesia of the individual organs of the abdominal cavity is possible

There are three kinds of fibers in the splanchnic nerves (1) vasomotor fibers for the vessels of the intestinal tract (2) motor fibers for the muscles of the intestine and (3) sensory fibers There are three splanchnic nerves the major the minor and the minimus The major splanchnic nerve begins at a level between the fifth and the ninth ribs and has from one to five roots which usually originate with the major splanchnic nerve but sometimes runs separately to the renal plexus sending only a small branch to the major splanchnic nerve The minimus splanchnic nerve which is rarely found is a small branch which begins at the last sympathetic ganglion and runs to the renal plexus

In the thorax the splanchnic nerves are covered by the costal pleura and may shine through it. Running downward they disappear between the median and lateral crura of the diaphragm into the abdominal cavity where dividing they run into the coeliac plexus and semilunar ganglion In the abdominal cavity the splanchnic nerves are covered by the parietal peritoneum

The number of splanchnic nerve roots the level of origin of the splanchnic nerves, and the angle of division of the individual roots show considerable variation A comparison of the nerves of the left and right sides does not always reveal symmetry the left splanchnic nerve usually begins higher than the right The number of nerve roots is greater in the embryo than in the adult and in the young their angle of division approaches a right angle whereas in adults the angle is acute Sexual differences could not be demonstrated The right splanchnic nerve ends in the coeliac plexus at a lower level than the left

Isolated infiltration of the splanchnic nerve is almost never possible the injected fluid is always found in the region of the sympathetic nerve When the injection is made high (at the level of the twelfth thoracic vertebra) the fluid may also infiltrate the right vagus nerve For infiltration of the

surface of the vertebra The needle must be inserted into the right median crus of the diaphragm between the aortic hiatus and the oesophageal hiatus and directed upward and backward

Isolated anesthesia of the upper abdominal viscera can be obtained by injecting into the coeliac and the superior mesenteric plexus As the sensory fibers in the coeliac plexus extend up to the level of the second lumbar vertebra through the rami communicantes it seems necessary to anesthetize the coeliac plexus in addition to the splanchnic nerves This can be done easily under direct vision

WALCHER (Z)

Mayeda, T Investigations on Parabiosis, with Particular Consideration of Transplantation and Hypernephrectomy (Untersuchungen ueber Parabiose mit besonderer Beruecksichtigung der Transplantation und Hypernephrektomie) *Deutsche Ztschr f Chir* 931 cxcvii, 295

Mayeda did the Sauerbruch Heyde coelio-anastomosis on each of two young white rats Mice and guinea-pigs proved failures Of seventy five pairs of rats twenty remained alive more than five weeks The two partners were obtained from the same litters in eleven instances from different litters in four and from unknown litters in five One of the pair frequently showed normal or increased growth while the other was stunted and died first Such parabioses the author calls "heterogeneous In homogeneous parabiosis both of the partners develop equally well These are the basic and constant types of parabiosis

Mayeda claims that the animal of the heterogeneous parabiosis which dies first does not heal together with its partner but becomes separated from it by leucocytes and a wall of granulation tissue and shows changes like those of pernicious anemia in the bone marrow and spleen its blood is haemolyzed by the serum of the other animal.

The author agrees with Schoene that the parabiosis is a reciprocal homoioplastic the transplantation is successful (homogeneous parabiosis) or unsuccessful (heterogeneous parabiosis)

Microscopic examination of the border layer and experiments with the injection of dyes during life and after death were made in cases of well and poorly healed parabioses Dermal autoplasties in individual rats were almost always successful if the animals were no older than three months After that age they were difficult Freely transplanted pieces of skin were viable in 34 per cent of the non parabiotic rats from the same litter and in 28 per cent of those from different litters If the transplant took the subsequent parabiosis of the animals was usually successful

Pedicled flaps were exchanged between ten pairs of non-parabiotic rats and were sectioned after seven to fourteen days In five animals the transplants remained intact for longer than a month and

homoioplasty was never successful In the separa

pairs of parabiotic rats After nineteen days one-quarter of the adrenal cortex transplanted into the kidney was found in one instance Bone homoioplasty failed in parabiosis The bilateral exturpation of both adrenals of one partner was well borne by ten well-developing pairs of parabiotics but pairs showing unequal development rarely survived whether the two adrenals were taken from the

the parabiosis. In this way a procedure was developed for inducing further growth of the accessory adrenals

A bibliography of sixty-one titles and nine microscopic pictures are appended SCHMIDT (Z)

ROENTGENOLOGY AND RADIUM THERAPY

[illegible] and [illegible]

Ill 1933 xxxv 187

The authors conducted a series of experiments upon normal dogs for the purpose of investigating the systemic intoxication which develops after a

suitable exposure to large doses of hard roentgen rays Full details of the methods followed are given, together with the results obtained from clinical findings are

[illegible] f the dog (abdomen shielded) gives no clinical evidence of intoxication even when large doses (up to 512 ma min are used) There may be a transient leucopenia and a slight rise in urinary nitrogen

Roentgen radiation of the abdomen of the dog (thorax shielded) with a dose of 350 ma min will almost certainly cause a fatal intoxication. Smaller doses may be survived but usually cause signs of gastro-intestinal intoxication

The lethal intoxication due to abdominal radiation presents a remarkably uniform clinical and anatomical picture There is a latent period of twenty four to thirty-six hours during which the dog is perfectly normal clinically The second day usually shows the beginning of diarrhœa and perhaps of vomiting The third and fourth days show progressive intoxication with increasing vomiting and bloody diarrhœa until the dog becomes stuporous Death almost always occurs on the fourth day

Anatomically the only important lesions are to be found in the small intestine The epithelium of the crypts and villi shows more or less complete necrosis and this condition may involve almost all of the small intestine. The epithelium may vanish completely except for a few cells here and there which have escaped and are often found in mitosis probably an effort at repair and regeneration

The authors are forced to the conclusion that this remarkable injury of the epithelium of the small intestine is responsible for the various abnormal reactions and final lethal intoxication which follow a unit dose of roentgen radiation over the abdomen of a normal dog The sensitiveness of the intestinal epithelium to the roentgen rays is not appreciated and should be given proper consideration in clinical work. ADOLPH HARTUNG M D

[illegible] S L and Whipple, G H: Roentgen Ray Intoxication III The Speed of Autolysis of Various Body Tissues After Lethal X Ray Exposures. The Remarkable Disturbance in the Epithelium of the Small Intestine. *J Exper M* 1922 xxxv 213

1922 xxxv 205

The experimental data of this article supplement those of a previous article on the same subject All of the experiments previously performed made it very clear that initial injury of the epithelium of the small intestine was responsible for the severe clinical reaction and lethal intoxication It seemed desirable to study this reaction carefully and to record the histologic and gross changes which day by day followed the initial exposure Therefore a number of dogs were given lethal doses of roentgen rays over the abdomen, and autopsied at varying intervals thereafter The results are recorded in the following summary

The first twenty four hour period following the exposure is negative clinically and anatomically but histologically there are distinct changes in the bone marrow spleen lymph glands and ovaries, and definite nuclear changes with degeneration in the crypt epithelium of the small intestine

The second twenty four hour period shows slight clinical disturbances of gastro-intestinal nature (vomiting and diarrhœa) The mucosa of the small intestine shows scattered ecchymoses The necrosis of the crypt epithelium may be almost complete while the epithelium of the villi remains practically intact Slight œdema and invasion of wandering cells are noted

The third twenty four hour period shows increasing clinical disturbance with vomiting and bloody diarrhœa. The small intestine from the edge of the pylorus to the rim of the ileocæcal valve is raw red and inflamed. The crypt and villous epithelium has in large part vanished leaving a collapsed framework of the mucosa showing a little œdema and invasion of wandering cells

The fourth day marks the peak of the intoxication and coma followed by death usually develops at this time The anatomical and histological picture resembles that of the third day There is more evidence of mitosis and efforts of repair on the part of the intestinal epithelium.

The stomach is not concerned in this reaction but the colon may show evidences of slight injury The colon is obviously much more resistant than the small intestine

The authors believe the evidence is conclusive that the stormy clinical picture and fatal intoxication are due entirely to the injury to the epithelium of the small intestine ADOLPH HARTUNG M D

Warren S L and Whipple, G H: Roentgen Ray Intoxication III The Speed of Autolysis of Various Body Tissues After Lethal X Ray Exposures. The Remarkable Disturbance in the Epithelium of the Small Intestine. *J Exper M* 1922 xxxv 213

[illegible] cells of the small intestine involving both the nucleus and the protoplasm In this article they show that autolysis in these cells is profoundly modified by such exposures. In the experiments on which it is based dogs were killed two twenty four forty-eight seventy two or ninety-six hours after exposure to radiation The methods employed the experimental observations and the findings in several normal control animals are reported in detail

It was found that exposure to large doses of [illegible]

demonstrated readily in material obtained from dogs killed two, twenty four forty-eight seventy two or ninety-six hours after the initial radiation

In the radiated dogs the secretory crypt epithelium of the small intestine autolyzed first and the epithelium of the villi last while the reverse was true in the normal control small intestine These abnormalities of autolysis associated with lethal roentgen ray exposures could be demonstrated in the small intestine over the whole four-day period subsequent to radiation

The colon showed little change and the stomach no demonstrable changes in autolysis under like conditions The kidney also was negative

The spleen, lymph glands, liver and pancreas of radiated dogs showed a moderate increase in the rate of autolysis within forty-eight hours of the initial exposure.

What the significance of this disturbance of cell ferments in the intestinal mucosa may be the authors cannot say At least these observations strengthen their confidence in the profound functional disturbance of this important intestinal epithelium a disturbance which they believe is responsible for the clinical abnormalities and fatal intoxication

ADOLPH HARTUNG M D

Stern, S : Intensive X Ray Therapy as Seen Practiced in the Clinics in Europe *Am J Roentgenol* 1922 n s viii, 741

Stern reports in detail the main points in the technique employed at the various clinics of Frankfort Freiburg Erlangen and Berlin Aside from the virtual agreement as to the necessity for apparatus delivering at least 200,000 volts and as to the employment of heavy filters, he found the greatest divergence of opinion with regard to even vital questions of technique The varying techniques described may be averaged as follows distance 30 to 50 cm field, 6 by 8 cm to 25 by 25 cm time one to six or seven hours filter ½ to 1½ mm copper or 0 5 to 0 75 mm zinc voltage 180 to 200 kv and milliamperage 2 to 2½

Stern thinks well of the fontoquantimeter employed by Friedrich at Frankfort and of the charts designed by
varying depth
vergence in t
and far fields to get the benefit of a larger proportion of depth dose and another prefers concentration with compression to get nearer to the lesion Some insist on the importance of applying the entire carcinoma dose within twenty four or forty-eight weeks and one clinic applies an erythema dose every month for four or five successive months, considering it not only safe but necessary Some of these questions Stern believes will eventually decide themselves Treatments of seven hours a day for two or more successive days and because of the time element the use of 1 ½ mm copper filters are impracticable The time when an erythema dose may be repeated will be found somewhere between the extremes mentioned Stern would hesitate to give four or five erythema doses at monthly intervals On the other hand he does not believe it necessary to wait six month

As to the choice of case it was found that most of the clinics visited have practically discontinued operating upon all cases of carcinoma of the breast and uterus They claim that in unselected cases a cure is obtained in approximately 8 per cent In malignant growth of other organs the results are not so satisfactory All of the clinics emphasize the fact that sarcoma should never be treated surgically as the chances of metastasis are very much increased by operative interference

DAVID R BOWER M D

Prof

In the case reported the breast and axillary glands of a woman 66 years of age were removed for cancer in May 1921 In August the vicinity of the scar showed redness but the scar itself was normal Nine treatments with the X ray were given, but in spite of this the redness and neoplastic infiltration of the skin increased The recurrence developed in a

of the X rays

This case shows the high therapeutic value of irradiation and the difficulty of carrying a sterilizing dose to the entire surrounding area Radium and X-ray therapy given in conjunction with extensive surgical excision should be begun at the periphery of the ablation Such a procedure would allow the radiation of extensive fields W W BREWER

Holmes, G W : Some Observations on the Treatment of Hyperthyroidism with X Rays. *Am J Roentgenol* 1922 n s viii 730

tion There is the most serious and irreconcilable difference of opinion, however regarding the question as to when an erythema dose should be repeated Some say not within six months others repeat in six

that treatment may be agreed upon. Old cases are

examined before any change is made in the treatment and for observation or discharge

Metabolism tests are made before during and after treatment. Sources of infection and the presence or absence of cardiac or pelvic disorders and an enlarged thymus are determined when possible The patient s occupation home life, and distance of residence from the clinic are considered. A photograph of the patient is made and the pulse rate weight temperature, and metabolism rate are charted

Colloidal cystic and simple goiters are not treated by radiation. If removal is advisable surgery is recommended For malignant goiters immediate operation followed by radiation is advised If surgery is contra indicated the X ray alone may bring about a temporary cure Toxic adenomata respond readily to X-ray treatment but surgery is quicker and as the surgical risk is slight most of these cases are referred for operation.

Non toxic adenomata have not been treated by X ray though it is possible that localized nodules may be reduced by this method As a rule these cases are kept under observation or treated surgically Exophthalmic goiters are usually treated first by rest and radiation The surgical risk has been found to be greatest in this class of cases and they respond well to radiation The importance of rest increases with the degree of toxicity Patients with a very high metabolism are given rest before the X ray treatment is begun Radiation reduces the operative risk by destroying the thymus and If not too prolonged does not make the operation more difficult A large percentage of cases so treated never come to operation

From our present knowledge it is fair to assume that when the thyroid gland is radiated the function of the gland cells is inhibited. As the dose is increased these cells atrophy and disappear to be replaced by connective tissue Later the contraction of this new fibrous tissue may interfere with the blood supply and still further inhibit glandular function. Therefore the dose should be adapted to the type of case It must also be kept within the limits of skin tolerance Holmes has employed an 8- "
in
L
was used In most of the cases three areas were exposed one at each side of the neck and one over the thymus. In some cases, with the use of a 16-in distance, the area exposed included the entire thyroid and the upper portion of the thymus The interval between treatments is usually three weeks.

In striving for the maximum effect short of an erythema dose Holmes believes it is safer to diminish the interval rather than to increase the dosage. Basal metabolism tests are made frequently and when the rate reaches normal the treatment is stopped If the drop has been rapid it is stopped sooner In cases which respond favorably an improvement in the nervous symptoms is usually noted at the end of the first three weeks Frequently a severely toxic patient is able to return to work after the third treatment, and from that time the treatment need not interfere greatly with his routine In cases which are more stubborn rest should be insisted upon or surgery resorted to after the fourth or fifth treatment

its
ult
of
operation has not been increased by four or five

erythema dosage If not avoided they may be more disfiguring than the surgical scar

DAVID R. BOWEN M D

LEGAL MEDICINE

No Malpractice in Treatment of Knee and Abscesses. *Hanson vs Harris (S D) 184 N W R p 262*

The plaintiff's right knee was run over by a wagon wheel. A physician was called, but the knee soon became very much swollen inflamed and very painful About two weeks after the injury the defendant was asked to treat the case and moved the plaintiff to his hospital. On opening the knee joint the defendant found a large cavity extending 5 in. above the knee which was filled with thin seropurulent pus. A number of abscesses containing pus had formed about the knee. The defendant made four incisions, drained and cleaned out the abscesses, and applied the proper drainage and irrigation. By examining with his finger inserted through the incision into the cavity of the knee, he found that there was no fracture of any of the bones. The joint was badly infected, however and the bone had become infected to some extent.

Following this treatment the swelling and the temperature went down, and about ten days or two weeks after the plaintiff entered the hospital the defendant injected Beck s paste into the joint abscesses and pus cavities Soon thereafter another abscess formed on the calf of the leg but healed quickly after it was opened drained and irrigated At the end of five or six weeks the plaintiff was discharged from the hospital as cured His knee was then nearly stiff and so bent that when he stood up only his toes touched the ground Eight months later he went to another hospital where the knee joint was opened and necrosis of the bones of the joint especially of the lower end of the femur was discovered Small quantities of Beck s paste were found also in the joint and a roentgenogram taken some months later showed that some of the paste still remained in the cavities formed by the abscesses

After a thorough analysis of the testimony the court failed to find any facts that warranted the conclusion that the defendant was negligent or unskilful in his treatment of the plaintiff s injury or that

any other course of treatment known to the medical profession would have produced better results The plaintiff had suffered much pain and no doubt would continue to suffer great pain and much inconven

It was argued that the use of Beck s paste was unnecessary and under the circumstances was improper treatment because the paste was intended to be applied to cases of chronic or tuberculous abscesses, while the abscesses in this case were acute The defendant however appeared to have used the paste in the exercise of his best judgment that it was necessary to hasten the healing of the abscesses about the knee. The court did not agree either with the contention that the defendant should

stiff after it healed the splint was removed

J A Capps, M.D.

Treatment of Alleged Osteomyelitis with Vaccine —Mistakes in Judgment. *Edwards et al vs Uland (Ind.) 131 N E R* p 240

The plaintiff alleged that the defendants had carelessly and negligently advised and used the vaccine treatment for osteomyelitis in the upper part of his left arm. The evidence showed that after obtaining the history of the case the defendants stripped the patient to better observe the results of past ailment and treatment. There were numerous scars due to operations. Because of a history of osteomyelitis, they made use of the common tests to discover the presence of that disease viz. the determination of the blood pressure, a blood count microscopic examination of the blood for infection, urinalysis, and a roentgen-ray examination of the affected arm The latter appeared to show a normal condition of the bone The findings indicated that there was no osteomyelitis at that time and no need for a surgical operation Vaccine treatment was therefore believed to be the proper treatment

The court stated that the defendants did not admit they were mistaken in the method of their treatment, but even if they had been, this was not of itself sufficient to require them to respond in damages. When there is a reasonable doubt as to the nature of the physical conditions involved or as to what should be done in accordance with recog

surgeon possessing great learning and skill might perform a certain operation when another of equal learning and skill would not perform such an operation, the difference being due to their judgment as to the necessity for the intervention

There is no presumption of negligence or want of skill from a failure to cure The mistake of the physicians in this case if any was in determining after careful diagnosis the method of treatment that they would follow—in assuming that a cure would be effected by the use of vaccines without surgery If there had been a question as to whether they were careless and negligent or unskillful in the use of the method chosen, there would have been a question for the jury as to a fact Under the facts proved there was at most only a mistake in judgment after a careful diagnosis of the case. Therefore the judgment entered on a verdict in favor of the plaintiff was reversed and instructions were given the trial court to grant a new trial. J A Capps, M.D.

Roentgenograms as the Best Evidence. *Daniels vs. Iowa City (Ia.) 183 A L R* p 415

The supreme court of Iowa in affirming a judgment in favor of the plaintiff for damages for personal injuries, stated that the record showed that an expert was permitted to testify as to what roentgen-

dence rule as applied to roentgen ray photographs is not desirable, but it could not be said that any prejudice resulted in sustaining the objections to the questions propounded.

It is proper for an expert to explain a roentgen ray photograph in the particulars that are not understood by a layman. What the jury could see and understand about the matter is not the subject of expert testimony and this the supreme court understood to be the effect of its prior decision A roentgenogram may be used for purposes of demonstration by an expert as if he had the object itself before the jury for explanation That bone can be distinguished from the flesh in a roentgen-ray photograph and that bone makes a heavier shadow than muscle is proper expert testimony Such scientific facts are not known by the average layman.

J A Capps, M.D.

GYNECOLOGY

UTERUS

Mironowa S M Two Cases of Perforation of the Uterus with Penetration of the Abdominal Cavity by a Bougie (Zwei Faelle von Uterusperforation mit Austritt des Bougie in die Bauchhoehle) *Sborn rabot po akusch i ginek* 1921 i 113

The number of induced abortions has greatly in
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In the first case reported by the author a bougie was inserted by a midwife into the uterus of a non pregnant woman 21 years old because of the suspicion of pregnancy The bougie disappeared within the next few days. Twelve days later a median laparotomy was done The bougie was found in the abdominal cavity among adhesions in the right anterior fornix. The uterus showed a small depression with a blood clot Removal of the bougie was followed by recovery

In the second case a midwife introduced a bougie twice into the uterus of a woman 26 years old who
ne bougie dis-
that it had
cessitated its
removal, and on the fourth day the patient entered the hospital. A laparotomy disclosed a local purulent peritonitis and the bougie lying free in the

posterior wall Hysterectomy was done, the stump covered with peritoneum the abdominal cavity closed and the vagina drained. Recovery followed

SCHAACK (Z)

Proust R. and Mallet L. The Respective Indica

A study of published statistics shows that following surgical treatment of cervical cancer the number of patients with recoveries lasting more than five years is little more than 30 per cent of the number of those surviving the operation

Following radium therapy not more than 20 per cent of the patients survive more than five years

Following penetrative roentgenotherapy the survivals for more than five years equal 60 per cent in operable cases and 23 per cent in inoperable cases while the average for all is about 30 per cent. After five years the percentage of survivals falls to 20 per cent.

Radium therapy and roentgenotherapy have a lower immediate mortality than operative treatment but operative treatment is followed by longer survival

as revealed by biopsy

1 Clearly early cases in which the uterus is still mobile

2 Cases still clearly operable but with invasion of the ligaments.

3 Cases with inoperable ligamentary invasion, but in which the general condition is good

4 Very advanced cases

In the first class radical operation should be done The surgeon must be sure to reach healthy tissue In such cases the operative mortality is low and surgery offers a better prognosis than any other treatment Frequently the operation should be preceded by a vaginal application of radium but the delay must not exceed three weeks Also it is of advantage to give penetrative X ray treatment of the broad ligaments at least one month after the operation to destroy any malignant cells that may have remained in the pelvis

In the second class of cases in which there is invasion of the broad ligaments, operation offers less certainty of cure and it is better to use radium therapy which gives as complete destruction and has a much lower mortality rate The application of the radium to the uterus and vagina however is not sufficient It must be placed in the midst of the broad ligaments or its action must be immediately supplemented by penetrating irradiation of the parametrium with the X ray

never within the vagina

In very advanced cases the X rays should be employed but with care to avoid massive dosage.

Other factors to be considered in the choice of treatment are the time which has elapsed since the beginning of the condition and the nature of the

ction

(about six weeks)

The type of neoplasm is important In cases resisting radiotherapy operative intervention may find new indications besides those mentioned

For postoperative destruction of cells the authors of radium with or without associated penetrative cicatrization Radium therapy as a postoperative adjuvant is rejected because its principal (intrauterine) use is rendered impossible by the removal of the uterus W A Brennan

ADNEXAL AND PERI-UTERINE CONDITIONS

Polak, J O., and Welton, T S.: A Study of the Origin of Bleeding in Ectopic Pregnancy In: *J Obst & Gynec* 19 2, iii, 64

The authors studies have shown

1 That a decidual reaction may be found at several points in the tube in ectopic points often far remote from the seat of implantation

2 That coincident with the separation or death of the ovum due to hemorrhage into the decidua tium into the peritoneum and that this blood gravitates into the cul-de-sac

4 That the same factors contribute a portion of the blood making up the bloody discharge from the uterus which signifies the separation or death of the embryo L L Cornell, M D

Hirschfeld, T.: The Surgical Treatment of Inflammatory Tumors of the Adnexa (Die operative Behandlung der entzuendlichen Adnextumoren) Dissertation Berlin, 1921

The chief cause of inflammatory tumors of the adnexa is gonococcal infection It is believed that 50 per cent of inflammations of the adnexa are of gonorrhoeal origin In the less frequent septic and putrefactive processes the streptococcus, staphy only about 10 per cent of all diseases of the adnexa should at first be conservative whatever the cause. In from 70 to 90 per cent of cases such treatment effects a cure In some instances, however expectant measures are useless and operation is indicated It is usually in the cases of women of the working classes who cannot take sufficient rest to allow the inflammatory process to quiet down that cure can be obtained only by operation These are usually cases of tumors of the adnexa in a subacute or chronic stage

The question arises whether operation is indicated also when an acute septic process is present a rapid enlargement of the pyosalpinx can be determined and there is danger of rupture of the pus sac Doederlein and Krönig refuse to operate in these cases If operation must be performed the abdominal route is preferable to the vaginal as in the latter there is greater danger of injuring the intestine

For the skin incision Pfannenstiel's transverse traction and freed from the uterus Over against these more or less radical operative methods for tumors of the adnexa of gonorrhoeal origin stands the conservative surgery which must be employed if cessation of function is to be avoided in the cases of young women In such cases one is limited to resection of the tubes A wedge-shaped excision of their interstitial portion is recommended If the ovary on one side is involved it must be removed as well In bilateral disease of the ovaries an attempt should be made to preserve at least a portion of one ovary in order not to arrest ovulation and menstruation If there is occlusion of the tubes unassociated with more severe inflammatory changes and giving no trouble except sterility mutilating operations must be avoided Recently repeated attempts have been made in such cases to restore the function of the tube by the formation of an artificial ostium

It is often very difficult to determine with certainty whether disease of the adnexa is tuberculous or not Usually this can be done only by the process of exclusion In general, tuberculosis of the genital organs shows a strong tendency toward healing Consequently there is seldom an urgent indication for the removal of tuberculous tumors of the adnexa However if the disturbances are so great that surgery is necessary the operation should be as conservative as possible that is, it should be limited if possible to removal of the tubes, especially since as a rule the patient is a young woman

Dresden (Z)

Janney J C.: Report of Three Cases of a Rare Ovarian Anomaly *Am J Obst & Gynec* 1922 iii, 1 3

The three cases reported showed the presence of uterine tissue in the ovary They were found in going over 4,853 pathologic specimens at the Free

Hospital for Women Brookline Mass They were all discovered incidentally the operations having been performed for other conditions which had not directed attention to the ovaries primarily

E. L. CORNELL, M.D

Martzloff K. H Dermoid Cysts of the Ovary; A Report of Four Cases. *Bull Johns Hopkins Hosp* 1922 xxxiii, 66

In discussing four cases of dermoid cysts of the ovary the author emphasizes

1 The importance of puncturing the ovary or a small ovarian cyst for diagnostic purposes when conservation is to be practiced

2 The value of routine examination of all pathologic tissue removed at operation

3 The feasibility of conserving a portion of normal tissue of one or both ovaries, even in the presence of a dermoid growth in order that thereby the danger and inconvenience of an operative menopause may be avoided

Only one case of dermoid cyst in association with, and included in the wall of a multilocular pseudomucinous cystadenoma of the ovary has been observed in the Johns Hopkins Hospital.

The incidence of malignant changes in a dermoid cyst in the Johns Hopkins Gynecological Clinic is 1 per cent.

HARVEY B MATTHEWS, M D

EXTERNAL GENITALIA

Payne, R L. A Technique for the Repair of Relaxed or Lacerated Perineum *J Am M Ass* 1922 lxxviii, 574

The salient features of the technique which has been used by the author satisfactorily for ten years are (1) the complete liberation of the entire rectocele from the muscles and fascia of the perineum to permit a thorough reduction of the herniated portion of bowel (2) the insertion of only nine stitches (3) the use of interrupted sutures and (4) simplicity and ease of execution of the operation

One Allis forceps is placed at the highest point of the rectocele where the anterior and posterior vaginal walls meet, and another at a slightly higher level on either side at the edge of the labia minoris The rectocele is separated from the levator ani by an incision and the rectum is freed from the muscles and fascia so that a crescentic shelf is formed

One suture is applied in each sulcus picking up only vaginal fascia and mucous membrane The rectocele being reduced with a rigid instrument a second suture passes over and catches the vaginal fascia and mucosa at the central point This suture *is not tied until the entire approximation is* completed Three interrupted sutures beginning and ending at a point half way between the levator shelf and the skin margin are then inserted and tied to maintain the reduction of the rectocele

A second row of sutures is begun just under the skin margin to approximate the second plane of muscles and fascia The e are inserted on a plane The

hes

C F ANDREWS M D

MISCELLANEOUS

Gruss, J : Surgical Treatment of Malformations of the Internal Genital Organs (Operativ Behandlung von Missbildungen des inneren Genitales) *Rozhledy v chir a gynaek* 1921 i 185

Laparotomy is preferred by the author in the majority of cases of malformation of the internal genital organs as it permits exact inspection of the organs within the abdominal cavity He recommends laparotomy unconditionally in pregnancy in the rudimentary horn of a bicornate uterus high *gynatresia, particularly when it is complicated by* hæmatosalpinx, in hæmatometra in a rudimentary horn of the uterus and in dysmenorrhœa due to rudimentary development of the uterus

In complete absence of the vagina Baldwin's method of substitution is recommended Rudimentary development of the uterus is not a all so rare as might be inferred from the literature A diagnosis of complete absence of the uterus on the other hand is erroneous as traces of this organ can always be demonstrated in the subperitoneal region.

EIKEL (Z)

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Fruhinsholz, A., and Parisot, J.: Anomalies of Thyroid Function in Their Relation to Pregnancy (Des anomalies de la fonction thyroidienne dans leurs rapports avec la gestation) *Gyn. et obst.* 1921, i, 69.

The authors have made a collective review of the literature separating the experimental and clinical observations and summing up the outstanding conclusions of the various reporters.

They discuss the experimental reports under the following general heads: (1) the influence of

animals with thyroparathyroid insufficiency.

Many observers have noted that during pregnancy the weight of the thyroid is increased both absolutely and relatively. Borzytowski who

which Civalier did not find in man. Lange even

tional

corpus luteum or the placenta or fetus is mentioned. Repeated injections of extract of the placentæ of rabbits injected into three virgin rabbits produced an enlargement of the thyroid as well as an enlarge-

In the discussion of gestation and insufficiency of the thyroid insufficiency of the parathyroids is included. The reader is referred to the monographs of Jeandelize on thyroid and parathyroid insufficiency (1902) and of Morel on the parathyroids (1912) for details of the functional relationship of these closely associated glands.

In the young thyroid insufficiency arrests the development of the genital organs and, occurring later causes sterility due to atrophy of the ovarian follicles (Hofmeister). For fecundation and the evolution of pregnancy the secretion of the thyroid is much more important than that of the parathyroids. Thyro-parathyroidectomy practiced on pregnant animals usually causes abortion, premature labor or stillbirth. If the pregnancy goes to term and live young are born, the mother is apt to develop tetany.

The effects on gestation, parturition and postpartum states were studied by removing as much of the gland as possible without destroying life or preventing fecundation. The results were uniform and showed that the pregnant animal is very much less able to stand the operation than the non-pregnant animal. The chief accidents which occurred were convulsions causing death, tetanic phenomena, albuminuria and hepatic and renal alterations. Tetany is especially apt to develop the parathyroids being apparently alone responsible for this. The non-pregnant animals almost invariably showed no reaction unless they later became pregnant when tetany usually developed.

In separate studies of the effects of deficiency of the two glands it was found that convulsions and the phenomena of intoxication such as dyspnœa and urinary disturbances are due to deficiency of the parathyroids while the trophic disturbances causing falling of the hair, apathy, etc., are due to deficiency of the thyroid. The effects of deficiency of these glands are sometimes delayed until after parturition. Successive pregnancies increase the severity of the disturbances. The mammary secretion is not affected.

The conclusions drawn regarding the relation of thyroid insufficiency to pregnancy are as follows:

1. Pregnancy, labor and postpartum conditions do not modify the animal's general condition.
2. Signs of thyroid insufficiency are increased in the course of or after the gestation.
3. In the course of the gestation at the approach or time of labor or postpartum, more or less characteristic phenomena of tetany appear which may cause death or disappear quickly after the delivery or the suppression of the mammary secretion.
4. The same phenomena appear in the course of a second or third pregnancy when they had not been *manifested previously*.
5. In certain cases these phenomena are favorably influenced by injections of thyroid extract.

In the offspring of mothers with thyroid insufficiency rickets is frequently present. Long has noted a decrease in the weight of the eggs of fowls. Iselin, working on parathyroidectomized rats found that the offspring were hyperexcitable to the galvanic current. Almagia noticed that young

following headings: (1) hyperthyroidism, (2) hypothyroidism, and (3) instable thyroids.

Hyperthyroidism exists in varying degrees and almost all the minor complications of pregnancy including glycosuria, insomnia vomiting sensitization to tuberculosis etc. have been attributed to it by various writers

Several cases
disease develop
after delivery
appeared again during a subsequent pregnancy

The study of the effects on pregnancy of a pre existing hyperthyroidism is difficult because of the lack of material only about eighty cases having been reported from the large obstetrical centers Of seventy-eight cases forty were aggravated by pregnancy twenty two benefited and sixteen unaffected Cases complicated by mechanical action or a cardiac condition are most apt to be aggravated The authors state that after fecundation hyperthyroidism has little effect upon gestation but according to some investigators it tends to cause abortion and according to others it predisposes to complications such as albuminuria œdema persistent vomiting placental hæmorrhages and hypertension.

The chief indications for surgery of the gland during pregnancy are mechanical embarrassment and malignancy

There is no predisposition to hyperthyroidism following gestation

Hypothyroidism may be congenital the result of the surgical removal of the gland, or due to replacement of the gland by a new growth

Because of faulty sexual development women with congenital hypothyroidism do not become pregnant

Surgery of the thyroid during pregnancy is frequently followed by tetany due to interference with the parathyroids It is only when trophic disturbances occur that the thyroid is responsible

Tetanic cramps are probably confused with eclamptic convulsions

Levy believes that the thyroid does not respond early in pregnancy and that therefore there is an initial stage of hypothyroidism which explains some of the early disorders

The myxœdematous patient rarely becomes pregnant Some of the syndromes attributed to hypothyroidism, such as migraine asthma etc. are occasionally greatly relieved during pregnancy but return after delivery Most of the observations on the definite myxœdema syndrome however indicate that the condition is aggravated by pregnancy As in hyperthyroidism, the course of the pregnancy itself is affected very little by the hypothyroid state

Under the term instable thyroids are classed
changes symptoms
of hyperthyroidism
t is made that the
hyperthyroidism which appears as a reaction to pregnancy may subside following the administration of thyroid extract

The offspring of mothers with instable thyroids seem to show a predisposition to internal glandular disturbances the nature of which cannot be predicted.

The conclusions drawn from the clinical material are as follows

1 Gestation physiologically causes a state of compensatory hyperthyroidism which tends to assert itself in the second half of pregnancy

2 This hyperthyroidism may pass the limits of a strictly compensatory reaction and become pathologic. It may manifest itself in any stage of gestation and sometimes appears only after labor as if the thyroid had been maintained in a natural state by the gestation

3 A previous hyperthyroidism is generally unfavorable for fecundation If fecundation takes place the symptoms are frequently ameliorated but occasionally may increase especially in the presence of mechanical pressure or a cardiac lesion.

4. Hypothyroidism is even less favorable for fecundation. If fecundation occurs the symptoms may be ameliorated by the response of the thyroid gland to the stimulus of pregnancy they may be aggravated if the gland cannot respond or they may remain unchanged

5 There is a relationship between tetany and the state of gestation and between tetany and insufficiency of the parathyroids

6 A latent parathyroid insufficiency may be revealed by tetany during gestation

7 If a pregnancy occurs either in the hyperthyroid or hypothyroid state it nearly always terminates normally If complications develop they are usually manifested by symptoms of autointoxication such as albuminuria œdema etc

8 Certain children of mothers with a profound alteration of thyroid function have a predisposition to glandular disturbances which are not necessarily the same as the disturbances in the mother

The conclusions from the clinical studies are in general identical with those drawn from the experimental studies especially those concerned with the diminution or absence of the thyroid or parathyroid function The influence of the alterations on the human fœtus however appears to be less marked.

An extensive bibliography is appended

C L Hartsock M D

LABOR AND ITS COMPLICATIONS

Speidel E.: An Analysis of the Potter Version *Am. J Obst & Gynec* 1922 iii, 150

Speidel discusses Potter version on the basis of a visit to Potter and a limited experience with his method in private and hospital practice He sums up his opinion of Potter's methods as follows.

1 Potter version is such a decided improvement over all the old established procedures that it should supplant all other methods of performing podalic version.

2 The delivery of the child after the version has been performed is such a marked advance over the old methods of breech delivery that it should supplant the latter at once.

3 Potter's effective treatment of the child at birth by gentle rational manipulations is so superior to the many rough treatments to which the asphyxiated baby has been subjected heretofore that it should be used by every obstetrician

E L Cornell, M D

PUERPERIUM AND ITS COMPLICATIONS

Balard, P : Secondary Immediate Perineorrhaphy (La périnéorraphie immédiate sécondaire) *Rev fr mé de gynéc et d'obst* 1922 xvii, 1

By the term secondary immediate perineorrhaphy Balard means any repair of the perineum made during the puerperium whether a delayed immediate suture or repair following the failure of a perineorrhaphy done immediately after delivery

Secondary perineorrhaphy has its origin in the contra indications and failures of primary immediate perineorrhaphy The causes of rupture of a primary perineorrhaphy are varied and numerous

Ordinarily the time for a secondary perineorrhaphy is between the tenth and twentieth days It varies however according to the conditions of the particular case but the operation should not be undertaken until fever has been absent for at least three days Favorable conditions will be hastened by careful attention to the vaginal discharge and the use of horse serum

The technique must be varied according to whether the perineal laceration is complete or incomplete The patient should be prepared as for a surgical operation Cocaine anesthesia is sufficient The wound is first cleared of granulations with the curette and the freshening completed by resecting

sary to detach the vaginal septum from the rectum Several rows of deep catgut sutures must be placed on the vaginal portion of the tear if it is complete, but only one row if it is incomplete A serous myorrhaphy of the levators and a drawing together of the deep planes to obliterate dead spaces complete the intervention W A Brennan

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Wright H. W. S.: A Study of the Surgical Pathology of Hypernephromata With Special Reference to Their Origin and Symptomatology *Brit J Surg* 1922 ix 338

This article is based upon research regarding the pathology of tumors arising in the renal cortex of man and animals. The author emphasizes the fact that the diagnosis must be made from sections from different portions of the growth rather than from one section alone. Hypernephromata are rare only six cases having been found among 10 500 cases of cancer but they form 6.5 per cent of renal tumors. They occur with equal frequency on both sides of the body. Males are affected slightly more frequently than females. As a rule the growths develop between the fiftieth and sixtieth years of age but they have been found in childhood also.

The most common initial sign is hæmaturia which occurs in 10 per cent of cases. Fever is frequently present even in the absence of infection, being due to the entrance into the blood stream of small amounts of foreign protein detached from the growth and causing an anaphylactic reaction.

The hæmaturia is of two types: (1) small in amount intimately mixed with the urine and due probably to blocking of the smaller veins by the growth which causes hæmorrhage into adjacent tubes; (2) profuse hæmaturia associated with the passage of clots and renal colic and due probably to involvement of the pelvis or invasion of one of the larger veins in the renal cortex. The second type usually occurs at a later stage than the first and is present in most cases.

outlet; (2) renal colic associated with the passage of clots and (3) acute attacks of pain in the kidney associated with extensive hæmorrhage into the growth. In a study of his cases the author was unable to find any definite relationship between the size of the growth and the pain complained of.

Retention of urine, difficulty of micturition and frequency are rare symptoms. Tumor is a prominent clinical feature. In the diagnosis the author places most reliance upon the cystoscopic examination, blood urea estimations, and the indigocarmin test. The X-ray may also be of assistance. Emphasis is placed upon the necessity of excluding chronic interstitial nephritis.

[illegible] are the [illegible]ssels [illegible]udy

of the growth and macroscopic pathology of these tumors raises the hope that local recurrence may be prevented by a more thorough removal of the perirenal fat. Examination of specimens showed little extra-renal infiltration but revealed invasion of the renal vein which was appreciable to the naked eye and made the prognosis almost hopeless. Specimens show that hypernephroma may occur in any part of the kidney.

Macroscopically hypernephromata are distinguished from other renal tumors by (1) compressed renal tissue surrounding the growth and resembling a capsule; (2) the presence of yellow areas of degeneration and (3) hæmorrhage and necrosis in the growths themselves.

The growths vary greatly in size. In shape they are generally spherical. They are divided into segments by fibrous trabeculæ each of which surrounds an artery. Microscopic study shows that in structure they are essentially papillary. Their appearance varies with the direction in which the sections are cut and the way the stroma runs. The shape and appearance of the cells vary greatly. From these variations several types may be distinguished: (1) those with a transverse perivascular arrangement; (2) those with a longitudinal perivascular arrangement; and (3) those of the looped capillary type.

In conclusion Wright reviews the various main theories which have been put forward to explain the origin of hypernephromata. Grawitz believed they arose from suprarenal rests. Sudek and Stock traced their origin to the renal tubules. In Wilson's opinion they develop from remnants of the wolffian bodies. Wright agrees with Sudek and Stock.

The article gives case histories and numerous photographs of kidneys. M. R. FLYNN, M.D.

Fromstein, R. M.: The Complications of Nephrectomy (Ueber bei Komplikationen bei Nephrektomie) *Vestnichnaja med* 1921 i 819.

One of the most frequent accidents in nephrectomy is the opening of the peritoneum. If suturing is done immediately complications are usually avoided. In two cases of secondary nephrectomy for renal fistula, however, this injury resulted in a fatal peritonitis.

The development of a fecal fistula is to be feared from the loosening of close adhesions to the colon. Therefore when such adhesions are present it is best to do a primary intestinal resection. In one case of renal tumor adherent to the cæcum Martynoff performed a nephrectomy and at the same time resected the cæcum and did an ileotransverseostomy. The results were good.

Intestinal gangrene is a rare complication of nephrectomy which is to be ascribed to lack of

nt who aids in
in the anterior
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Petrograd this
complication occurred four times it may be explained as due to venous thrombosis of the mesentery Injuries of the pleura, which are not very rare may be followed by pneumothorax and empyema If immediate suture is done, however complications are avoided

Hæmorrhage is the most dangerous complication of nephrectomy *Its source may be the normal* renal vessels, supernumerary renal vessels the vena cava, or the iliac artery The renal pedicle should not be ligated as a whole the ureter should always be isolated and the artery and vein tied separately as otherwise there is great danger of slipping of the ligature Special renal clamps which are allowed to remain in the wound are not absolutely safe as hæmorrhages have occurred even after a clamp has been kept in position for three days The possible presence of supernumerary renal arteries should always be taken into consideration With regard to injuries of the vena cava the author states that he has collected twenty five cases from the literature, *twelve of which ended in recovery* and thirteen of which were fatal The means used to stop the hæmorrhage were tamponade twice (both patients recovered) the application of a clamp to the rupture in five cases (two recoveries and three deaths), parietal]ligation in three cases (one recovery and

and vesical spasm, especially in tuberculosis of the bladder Operative interference has been necessary for this complication only in very rare instances.

operations were done The ureteral stump must

tion as these operations are major procedures and they do not positively prevent the formation of fistula since occasionally tuberculous foci are present in the bladder itself Therefore the ureter should be resected only so far as it can be done without difficulty and the stump should be doubly ligated with catgut, crushed with a clamp and burned through with the thermocautery

The most important and well known complication following nephrectomy is anuria due to functional deficiency of the remaining kidney Even when the most accurate functional tests are made such an occurrence cannot be excluded with absolute cer

the phlorizin and indigocarmin tests) but anuria occurred after nephrectomy performed under morphine ether anæsthesia Edebohls decapsulation of the kidney was done after thirty nine hours but death followed sixteen hours later Autopsy showed an acute parenchymatous nephritis

In conclusion Tronstein mentions as a complication of nephrectomy the presence of blood in the urine during the first few days following the operation The systematic search for blood corpuscles in the urine after nephrectomy showed their constant presence during the first four or five days, even when the other kidney was normal L Frankel (Z)

Sanes, K I: Ureteral Obstruction: Failure to Recognize the Condition as a Frequent Cause of Unnecessary Operation *J Am M Ass* 1922 lxxviii 475

Ureteral obstruction though not uncommon is frequently overlooked Its disturbances therefore *are often misinterpreted and improperly treated* The author reports three cases and discusses some of the causes of diagnostic errors Failure to recognize ureteral obstruction is due chiefly to the variety of its causes and secondary urological changes, and to the anatomical relations of the ureter to adjacent organs Sanes has found that of all the abdominal organs the appendix is most commonly involved in such diagnostic errors Next most frequently involved are the pelvic organs in the female because of their relation to the ureters and the not uncommon exacerbation of ureteral disturbances during menstrual periods Disturbances caused by ureteral obstruction are incorrectly attributed also to diseases of the rectum, colon, ileum seminal vesicles etc

The author calls attention to the importance of good clinical histories a physical examination of the urinary tract and organs adjacent to the ureter careful urinalysis, and an investigation of the

obstruction. L I Hess, M D

BLADDER, URETHRA, AND PENIS

Nordmann O: Obliteration of a Vesicorectal Fistula and the Repair of a Defect in the Urethra (Geheilte Blasen-Mastdarmfistel und Ersatz eines Harnrohrendefektes) *Ztschr f Urol* 1921 xv 473

Nordmann reports the case of a 9-year-old boy on whom he had operated immediately after birth for congenital atresia of the anus situated very high

up He found at that time a cloaca formed by the bladder and rectum Between the two organs was a wide communication. As the sphincter muscle was incomplete urine subsequently drained through the anus The urethra was normally formed and opened into the bladder

During the war an attempt was made by another surgeon to close the hole in the bladder by a plastic operation The attempt was unsuccessful and a portion of the urethra in front of the bladder for an extent of about 3 cm was so far destroyed by secondary infection that subsequently the urethra ended blindly at the perineum

Nordmann first established an artificial anus on the left side in order to obtain a clean operative field at the anus. From the skin of the perineum he made a substitute for the missing portion of the urethra and thus re-established its continuity to a point close to the opening in the bladder He then fash

Scholl A. J., Jr Histology and Mortality in Cases of Tumor of the Bladder *Surg Gynec & Obst* 1923 xxxvi 189

Three hundred and thirty-three bladder tumors removed from patients at the Mayo Clinic were reviewed in an effort to determine the mortality of the various histologic types of neoplasm In 262 of the 333 cases complete postoperative records were obtainable

Papilloma and epithelioma Of 168 tumors originating in the bladder mucosa seventy-one were malignant and three benign papillomata while ninety four were either solid epitheliomata or carcinomata all were removed surgically Of the three patients with benign papilloma two are living six years after the operation and one four years after the operation

Twenty-six (36 6 per cent) of the patients with malignant papillomata are dead after an average duration of life of eleven and one half months while the remaining forty five (43 3 per cent) have lived an average of two years and three months

Sixty-seven (71 2 per cent) of the ninety four patients with solid carcinoma are dead after an in four months after operation and the patient died eight months later The second patient died six months after operation. The third is living and well nine years after operation. This is an extremely malignant type of tumor The onset is insidious and in most cases the growth is not discovered until it has infiltrated the bladder wall extensively

Adenoma and adenocarcinoma. Five adenocarcinomata were found in the series. One of these patients died two years after operation and one had a recurrence in two years Of the remaining three who today are well, two were operated upon six months ago, and one two years ago The majority of tumors of this type occur in the upper portions of the bladder They are slow to metastasize and if a complete resection is done the chance for recovery is good

Angioma There were three cases of angioma One patient a girl of 7 years died of hemorrhage from a tumor growing from the bladder to the rectum The second patient was a man 76 years of age whose growth was inoperable The third patient a girl 19 years of age had a large tumor in the dome of the bladder but is now living and well five years after the removal of the growth Angiomata have a tendency to bleed readily In some cases they grow to enormous size causing distress by pressure on neighboring structures

Myoma. These tumors were uncommon, only one being seen in the series of cases reviewed This was found in the case of a man 50 years old who is now living and well eight years after operation Myomata are frequently mistaken for extravesical growths because they are covered by fairly normal bladder mucosa.

Myxoma Two specimens of myxoma were noted in the series One occurred in a child of 2 years who died two months after its removal The other was found in a child of 16 months and was inoperable death followed nine days after operation

Sarcoma The single sarcoma in the entire series was inoperable and was observed in a woman 39 years of age who died two years after exploratory operation Cases of sarcoma and myxoma are very poor surgical risks death occurred in over 50 per cent of the reported cases within six months after operation G H JACKSON JR M D

Stellwagen T C Jr: The Surgical Treatment of Papilloma of the Bladder *Therap Gaz* 1922 xlvi 77

three months.

In either type of malignancy patients surviving the first year have a fairly good chance of ultimate recovery

Squamous-cell carcinoma Of the series of 262 cases, six were cases of squamous-cell carcinoma three of these were inoperable The average duration of symptoms was only three months In one of the three operable cases a recurrence appeared with

rization.

already

Fulguration is an excellent procedure for a benign growth that can be properly fulgurated

The actual cautery in the form of a modified copper soldering iron gives better control of the cooking than the electric cautery and does it more thoroughly

It is well to remove as much of the base of the papilloma and bladder wall as is consistent with good surgery J S Lindenfeldt M D

GENITAL ORGANS

Cecil, A. B : Perineal Prostatectomy: A Detailed Study of 100 Consecutive Cases. *J Urol* 192 vi, 399-

This statistical study is very comprehensive Of one hundred and three patients who presented themselves, 100 were operated upon Two deaths occurred during preliminary treatment One patient, who was refused operation, died two weeks later The youngest patient was 52 years of age the oldest, 90 years and 4 months. Ten were over 80 years. The greatest number were between 65 and 69 years The average age was 68 7 years One patient over 90 years of age lived three years following the prostatectomy

The time of onset of the trouble varied Nine per cent of the patients had noted nothing unusual until the preceding year Eleven per cent had had trouble for ten years and 8 per cent had had trouble for from sixteen to twenty years

In 65 per cent of the cases the first symptom was frequency In 45 per cent, difficulty in 18 per cent pain in 3 per cent incontinence of urine and in 3 per cent complete retention.

Residual urine was present in 95 per cent of the cases In one the amount was 4,750 c cm. In 9 per cent it was 1 000 c cm or more and in 27 per cent 500 c cm or more Rectal examination revealed no enlargement in 13 per cent, moderate enlargement in 53 per cent, and decided enlargement in 28 per cent In 6 per cent the gland was smaller than normal

In ninety three cases preliminary treatment was carried out by the retention catheter or by a retention catheter combined with intermittent catheterization. In two cases preliminary treatment consisted of intermittent catheterization alone Two cases had suprapubic drainage at the time they were first seen in four cases suprapubic drainage was effected by Cecil in two cases preliminary drainage was obtained by means of a retention catheter plus suprapubic drainage and in two cases no preliminary treatment was given. Thirty two per cent of cases were drained for between two and four weeks. One case had catheter drainage for sixteen months Fifty per cent of the patients were out of bed during the entire time of the preliminary treatment Fifty-one per cent developed fever during this time

Young's operation was performed in every case. The essentials are (1) the preservation of the external sphincter (2) proper exposure of the prostate by taking advantage of the fascia of Denonvillier After exposure of the prostate an attempt is made to preserve the prostatic urethra by the original lateral incisions of Young through the vesicle neck with iodoform gauze The drainage tube he removes within twenty four hours.

In 5 per cent of cases the wound closed before the ninth day in 22 per cent before the fourteenth day in 51 per cent before the nineteenth day and in 74 per cent before the twenty fourth day In one case closure required one hundred and thirty three days. In one case permanent incontinence resulted. There were eleven cases of cancer

The mortality of prostatectomy in this series was 2 per cent H W L Waltman M D

Martin A. P The Verumontanum—A Clinical Study (El verumontanum estudio clinico) *Espitia med* 192 xii 3

The author gives a detailed description of the verumontanum from embryological anatomical and functional points of view He considers it the most important portion of the posterior urethra. All infections of the posterior portion of the urethra affect the verumontanum more or less and in many cases the verumontanum is itself the site of infection, such infection being regarded as a distinct pathologic entity known as "verumontanitis."

The verumontanum is to the seminal vesicles what the tongue is to the upper portion of the digestive tract Formerly the prostate gland was considered the focus responsible for chronic urethritis but recently this belief has lost some ground because chronic prostatitis is not quite as frequent as in former years and in the majority of the cases treated by massage a careful endoscopic exploration reveals the lesion in the verumontanum.

In all cases of chronic posterior urethritis the prostatic urethra and especially the verumontanum should be carefully examined. As the verumontanum is richly supplied with nerves infections of this anatomical structure have a decided effect on the entire nervous system Great difficulties are encountered in the diagnosis of diseases of the verumontanum because of confusing symptoms which often lead to the belief that the seat of the trouble is in neighboring parts such as the remainder of the posterior urethra, the prostate and the seminal vesicles Hence the necessity for careful endoscopic examination.

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severe pain during micturition and so many symptoms of vesicle irritation that he was led to the

belief that cystitis was present. Cystoscopic examination revealed an inflamed verumontanum which filled all the posterior urethra and bled very easily The other case was that of a patient of middle age who for four years had suffered with retention of urine following nervous exertion Endoscopic examination revealed an enormous verumontanum which obstructed the prostatic urethra.

In discussing the treatment the author advises the local application through the endoscope of a solution of silver nitrate. Only in very persistent cases should the solution be stronger than a 10 per cent solution. Tincture of iodine, if used at all, should be diluted and used with care as it causes a strong reaction with hæmaturia tenesmus strangluria, and even complete retention.

Recently Martin has obtained such satisfactory results with fulguration that he believes this method will eventually supersede all others

P R. Castellas M.D

Corbus, B C and O'Conor, V J The Familial Occurrence of Undescended Testes Report of Six Brothers with Testicular Anomalies. *Surg Gynec & Obst* 1922 xxxiv 237

Corbus and O Conor report briefly the history and physical condition of a Russian man and wife and their family of six boys and two girls Both parents were physically normal. Each one of the six boys has some defect in the development of the external sexual organs varying from an unilateral undescended testis to bilateral undescended testes one of which is intra-abdominal. In every instance one or both testes is undescended.

One of the girls is apparently normal while the other who is 15 years old, has never menstruated and has distinctly masculine characteristics.

The hereditary tendency in cryptorchidism both in human beings and in domestic animals has long been recognised Heredity and peritoneal adhesions are mentioned as the only accepted etiological factors. Harry Culver, M D

Mollá V M : Perineal Section (La talla perineal) *Med Ibera* 1921 xv 439

Mollá states that perineal section has been practiced since ancient times in diseases with calculus formation It was described by Hippocrates From Hippocrates until the time of Celsus no improvement was made in the technique Celsus performed transverse perineal section

Amonius of Alexandria practiced perineal trituration of large calculi Two centuries later than Celsus Antyllus recommended that the incision be made above the neck of the bladder rather than over its body Aetius invented a special bistoury for the sectioning of the deep tissues in the transverse perineal section of Celsus This was the precursor of the lithotome of Fray Cosme Paul of Aegina made a lateral oblique incision in the perineum

These modifications were the forerunners of all present-day methods of perineal section They persisted to the fifteenth century when Guy de Chauliac abandoned them and turned back to the original transverse section of Celsus The hypogastric section was used most frequently in the seventeenth century but in the eighteenth century was superseded by the perineal section especially in France and Spain. W A Bekkman

SURGERY OF THE EYE AND EAR

EYE

King, J J Total Blindness of Both Eyes Cured by Drainage of Sphenoid and Ethmoid Cells. *J Am M Ass* 1921 lxxvii 508

King reports the case of a woman aged 50 years who had symptoms referable to phenoid and ethmoid disease over a period of four months A decrease in visual acuity in th right eye for four days terminated in total blindness at the end of the fourth day

being absent The fundus was normal

In the roentgenograms of the sinuses made by Dixon the right ethmoids and both antrums were cloudy but the left ethmoids were fairly clear In lateral plates the ethmoids and sphenoidal regions were cloudy

On the evening of the day of observation King did a simple exenteration of the anterior and posterior ethmoids and removed the anterior inferior wall of the sphenoid Three days later Hunt reported negative neurological findings but a Wassermann test was four plus positive

Five days after the operation vision had improved, the patient being able to count fingers at 2 1 ft Seven days after the operation treatment for syphilis was instituted At the end of two weeks vision was improved to 20/40

Eleven days after the operation on the right eye the patient complained of decreasing visual acuity in the left eye Sight completely failed in a few days regardless of specific treatment for a period of two weeks Following an operation on the left

White, L. E Aeration of the Posterior Accessory Sinuses in Acute Optic Neuritis *Boston M & S J* 1922 clxxvi 1 2.

After a careful study of accessory sinuses and numerous cases with interesting findings White draws the following conclusions

The optic nerve is in close relationship only to the sphenoidal sinus and the posterior ethmoidal cell

In order to reach the tissue adjacent to it the other times it can be determined only after the most careful and painstaking study Roentgenograms are usually disappointing Great care is necessary to exclude brain tumors

No one etiological condition is responsible for all cases Purulent infections may account for a few but there are many in which the infection is non suppurative Poor ventilation and faulty drainage are all important predisposing factors The size and position of the middle and superior turbinates are of great importance in aeration of the posterior sinuses

White enumerates the causes of the pathology as follows

1 The direct extension of acute and subacute infections spreading to the optic nerve by continuity of structure

2 Toxemia The optic nerve may be involved by toxins originating in the accessory sinuses

3 Bacteremia Micro-organisms may be carried from the sinuses to the optic nerve by way of

5 Anaphylaxis There seems to be a similarity between optic neuritis and certain anaphylactic reactions comparable to asthma and hay fever As sinus infections cause asthma, it is conceivable that they might also produce engorgement about the optic nerve

The prognosis depends on the duration and extent of the loss of vision the condition of the fundus, and the virulence of the infection

Acute inflammation is frequently followed by spontaneous recovery

In chronic thickening of the turbinates there is probably some change in the lining of the accessory sinuses In such cases following the removal of the middle turbinate White removes the front wall of the sphenoid and uncaps the posterior ethmoid wall to obtain aeration

If the removal of all foci of infection such as teeth, tonsils, etc is followed by proper aeration a complete ethmoid exenteration is unnecessary

JAMES P FITZGERALD M D

Marx, E.: Eye Symptoms Due to Osteomyelitis of the Superior Maxilla in Infants. *Brit. J Ophth* 1922 vi 25

The author tabulates thirty five cases found in a careful search of the literature and describes cer

tain serious and probably frequent errors that are made in the diagnosis and treatment

The eye signs found were swelling of the lower eyelid conjunctivitis, exophthalmos fistula in the region of the lachrymal sac or the lower eyelid abscess of the lower eyelid and swelling of the vessels of the retina. Marx states that it is easy to confuse a purulent dacryocystitis with fistula formation with an osteomyelitis of the superior maxilla and it is essential that the examiner be careful in inspecting the canaliculi

Of the thirty five cases tabulated eighteen were cured Ten of the patients died and the results in seven cases are not known The author theorizes interestingly as to the causes of the osteomyelitis but states that too little work has been done to warrant any general conclusions. T D Allen M D

Lopez, C J Ribon Y and Chavarria A P Melanotic Epithelioma of the Conjunctiva (Epithelioma melanico de la conjuntiva) *Siglo med* 1922 lxix 174

A man of 38 years who was operated upon by the authors had a small deeply pigmented tumor in the internal angle of the right eye which had been noticed for the first time about eight months previously The tissues surrounding the tumor were very vascular and there was intense conjunctival irritation The tumor was diagnosed by Lopez as a melanotic conjunctival epithelioma.

The tumor was completely resected under cocaine adrenalin anæsthesia in a manner similar to the removal of a pterygium The patient left the hospital apparently cured but ultimately a recurrence will probably develop necessitating the removal of the eye. Histologic examination of the removed tumor confirmed the pre-operative diagnosis of melano-epithelioma W A Brendan

Møller P Metastasizing Sarcoma Following Foreign Body in the Conjunctiva (Metastasier ender Sarkom nach Fremdkoerper der Conjunctiva) *Ugesk f Laeger* 1921 lxxxiii 1230

A 47 year-old man had a splinter of wood lodge in the left conjunctival sac. Between two and three months later he noticed irritation with secretion and pain A papillomatous tumor was found which contained a fragment of the splinter

There were three recurrences following excision Metastases then formed rapidly in the glands in front of the ear and then in those of the neck and axilla and around the umbilicus Soon there was general subcutaneous extension even to the neck of the left femur Death occurred at the end of three and a half years The metastases in the glands yielded to X ray treatment but those in other parts of the body progressed

Microscopically the tumor was a large round celled sarcoma. Sarcomata of the conjunctiva are rare. According to Graefe and Saemisch, they have been observed occasionally following injury.

Deaudt (Z)

Herbert H. The After Treatment of Small Flap Sclerotomy *Brit J Ophth* 1922 vi 65

Herbert states that his failures in small flap sclerotomy were due to beginning massage too late He now believes the application of gentle sustained finger pressure through the lower lid may be begun on the afternoon or the evening of the day of operation and repeated two or three times daily the anterior chamber being partly emptied

After the first few hours the patient should be encouraged to keep his eyes open and to blink frequently A pad over the eye operated upon may be necessary for the first night or two but during the day only a shield should be worn

The author retracts his recent suggestion to restrict the small flap operation to cases of plus tension that can be reduced by eserin

He believes that surgeons are too easily satisfied with trephining and cites cases in which the elevated remains of conjunctiva over the dark scleral opening became progressively thinner

In conclusion he points out the recently limited return to the small flap sclerotomy and expresses the hope that with the help of the after treatment suggested the movement may be widely revived not that this operation is the ultimate solution of the glaucoma problem but because it is a partial settlement which is practical until a technical detail is discovered that will make ideal sclerotomy acceptable.

In advanced cases of glaucoma in which the sclero corneal wound heals more or less firmly other treatment is necessary James P Fitzgerald M D

Smith H : Glaucoma (Simple—Chronic) *Practitioner* 1922 cviii 131

Until more is known of the chemical physiology of the eye there seems to be little hope of determining the primary causes of glaucoma as distinguished from the final causes The theories so far advanced are practically all based on end causes The most plausible is Fischer's theory that glaucoma is an œdema of the vitreous caused by acidosis. If by acidosis is meant an abnormal substance circulating in the blood which has a special affinity for the vitreous in which it causes an œdema or if it is the absence of some normal substance without which the vitreous tends to become œdematous this theory seems very plausible as it is known that myxœdema is caused by the absence of a normal substance while in albuminuria the abnormal substance tends to cause an œdema of the cellular tissue of the larynx

Before Legrange the operative treatment of glaucoma was limited to iridectomy because this operation strips the iris from its attachment at the base and exposes the filtration area. Legrange began the complete excision of a small section of the sclerotic coat just behind the attachment of the conjunctiva to the sclerocornea (trephination) his object being to form a subconjunctival drain which would function for some time

Unfavorable results from trephination have been reported. The author however has employed it extensively with success and regards it as a less difficult operation than iridectomy through a scleral wound A 3 mm trephine is used, and an iridectomy is always done through the trephine wound In cases of acute glaucoma in which the sudden swelling of the lens in the development of

flected with the subconjunctival tissue (which is no longer loose) so as to give sufficient covering for the

and when released, tend to stay in position

The clockwork trephine is unsatisfactory as its speed cannot be regulated and it has a tendency to become rolled up in the loose subconjunctival tissue Elliot's trephine is so thin that it has a tendency to plunge, and because it is a one handed instrument its control is not as delicate as if the energy were distributed between the two hands. Gradle's trephine is admirable as it is thick and tapered in the cutting end and therefore does not tend to plunge.

At present trephination is done to form a permanent drain into the subconjunctival tissues The author thinks this is not satisfactory because if the eye is to remain normal there must be normal tension and therefore the establishment of a permanent drain to perform a physiological function is unsound if the drain is too large the tension is

of the eye trephination results in similar drainage of somewhat longer duration Neither drain remains permanent C Coleby Yancey M D

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Iglauer S : A Review of Recent Progress in Rhinoplasty *Med Times* 1922 l, 52

Iglauer reviews the progress made during the past few years in the operations for the correction of nasal deformity This advance has been due in a large measure to the impetus given plastic surgery by the World War In civil practice corrective rhinoplasty has advanced rapidly since the more general recognition of the fact that this type of operation constitutes a legitimate field of surgical endeavor

For the replacement of large nasal defects Gillies has devised an ingenious operation employing a skin flap with a tubed pedicle taken from an adjacent region such as the temporofrontal area The tubed pedicle is formed by parallel incisions leaving an attachment at each end The skin is undermined and raised and the free borders of the pedicle are sewed together After three weeks the flap attached to one end of the pedicle is raised and sewed into position in the nose the pedicle being left in its tubular form Subsequently the excess tubular tissue is severed from the nose, unfolded and replaced in the temporal region from which it was taken. When it is necessary to implant bone as well as skin a piece of cartilage or bone is implanted subcutaneously and included in the tube when the latter is constructed

Blair says that the two most important advances in rhinoplasty during the war were the recognition of the fact that the lining is as essential as the external covering and that the reconstructed parts should be cut from carefully made patterns

For the correction of saddle nose deformity the implantation of autogenous chondral cartilage has become the method of choice. Experimental and clinical observations show that when bone is transplanted into soft tissues it will gradually degenerate and disappear but that if the transplant is placed in contact with the cut surface of normal bone it will continue to live, especially if it is subjected to the stress of function It then not only survives but is capable of regeneration.

Carter states that in his experience rib implants in saddle-nose deformity have survived for years. This is contrary to the view held by many surgeons

When cartilage is employed it should be taken from the right costal synchondrosis and the peri

occurred in Iglauer s experience several weeks after operation Tieck who uses the middle or lower turbinate bone as the source of his implants reports excellent results The spine of the scapula seems also to be an excellent and easily accessible region from which to obtain bone grafts for nasal plastics.

The transplant is usually introduced through an incision made within the vestibule of the nose Dufourmentel describes a new invisible incision in the eyebrow Through this incision the soft tissues over the nose are elevated down to the tip and a cartilage implant is worked down into place.

Under modern antisyphilis treatment transplantation operations to correct the saddle nose due to lues seem to be more successful than in former years. Carter presented such a case in which he obtained an excellent result and Iglauer reported one in which seven salvarsan injections were given prior to operation and the transplant still remains intact after fourteen months

For the grossly oversized nose (rhinomegaly) Cohen describes a modification of the usual procedure. After elevation of the soft tissues through vertical subcutaneous incisions within the vestibules all irregularities are removed with a rasp With saw cuts first on one side and then on the other the nasal bones are severed at their attachment to the nasal processes of the superior maxillæ and from the bony septum so that the prominent lower ends of the nasal bones can be depressed. The tip is then shortened and elevated in the usual manner

As a mechanical aid in nasal surgery Whitman has devised a nasal splint to hold old fractures of the nose in place after their reduction This splint is cemented to the upper teeth and through a vertical arm makes pressure against one side of the nose Berne has devised an excellent concave rasp for the removal of the nasal hump As an aid to the rhinoplastic surgeon Iglauer has recently remodeled Pynchon s motor-driven handle Suitable rasps and saws have been fitted to it which materially shorten the time and labor of the operation. MARGARET I. MALONEY

THROAT

Coakley C G., and Pratt E. L.: Analysis of the Systemic and Local Conditions Following Tonsillectomy and Adenoidectomy *Laryngoscope* 1922 xxvii 81

The authors analysis is based on 926 cases operated upon for tonsils and adenoids during the period from January 1 1908 to July 1 1920 Questionnaires were sent to each patient asking for certain information and requesting re-examination if the results were not satisfactory

The ages of the patients varied from 6 months to 68 years Seven hundred and ninety four (86 per

cent) were given a general anæsthetic and 132 (14 per cent) were operated upon under local anæsthesia

The operative technique was the same whether the tonsillectomy was done under general or local anæsthesia. Suction was employed at all stages The tonsil was seized with forceps, the anterior and

beneath a clot which filled the fossa The treatment consisted in the removal of the clot and the application of a clamp and ligature

fifth day and three on the sixth day

Two patients had hæmorrhage from adenoids One of them developed acute otitis media

Six patients have died since the operation All deaths occurred several years later Two were due to endocarditis, one to diabetes, one to meningitis and one to injury The cause of one death is unknown

Of the 926 patients only 689 replied to the questionnaire

Of the nine patients with sore throats who reported no benefit from the operation tonsillar tissue was found on re-examination in only one. Of the eight others, one had sinus disease, one, a deviated septum with dry pharyngitis and five, hypertrophy of the lymphoid tissue on the lateral and posterior pharyngeal walls

One patient who complained of quinsy following operation had a small piece of tonsil in the right fossa.

Four patients with enlarged cervical glands stated that the glands were greatly reduced in size and four reported no benefit.

There were forty-two cases in which ear trouble was given as the primary cause for the removal of tonsils and adenoids.

Thirty five patients sought relief for mouth

In one of the cases in which it was unsuccessful there was sinus disease and in one a recurrence of adenoids

Twenty per cent of the patients gave some systemic condition as the chief cause for operation Fifty five conditions were mentioned

Of the five heart cases, the results were reported as entirely successful in three and as only partially successful in two

Five patients with kidney lesions had acute nephritis All were benefited, the symptoms having disappeared

Of five asthma cases, the operation was successful in one only partially successful in two and unsuccessful in three

Two diabetic patients were operated upon without benefit Fifteen patients with a run-down general condition were completely relieved

Secondary operations were done on 145 patients One hundred and fifteen of these had had one previous operation twenty three had had two and seven had had more than two operations

One hundred and seven patients had had rheumatism previous to operation Ten reported that they were cured seventy-five stated that they were better and twenty two were unimproved Of the forty-six patients who gave rheumatism as the primary cause for operation, only eight reported no benefit These eight patients were examined and found to have no remaining tonsil tissue

Frequent colds in the head were reported by 472 patients In 346 cases the operation was entirely successful, in thirty two partially successful, and in ninety two not successful.

One hundred and eight patients had had frequent attacks of earache before operation Eighty were entirely relieved, seven partially relieved and twenty-one not benefited.

Fifty-three patients had had frequent attacks of otitis media before operation Thirty seven reported an entirely successful result five a partially successful result and eleven no benefit

Sixty-six patients had earaches or acute otitis media after the removal of tonsils and adenoids Seventy-seven per cent of these were children

to have tonsil tissue

A summary of the replies shows that the operation was satisfactory in 539 cases, without benefit in eighteen, and unsatisfactory in thirty four In 30 cases the operative indications were not relieved.

Seventy
naire.

1 W
warrants its removal, age is as negligible a factor as it is in the consideration of any other common surgical operation

2 Hæmorrhage either during or after operation can and should be controlled according to the same surgical principles which govern its control elsewhere in the body during a surgical operation

3 A well performed tonsillectomy and adenoidotomy causes a marked lessening of the acute infections of the upper respiratory tract and lessens the tendency toward attacks of acute middle-ear infection

4 The percentage of successful and partially successful results in cases of rheumatism justifies the removal of tonsils in cases in which the tonsils are proved to be diseased and the elimination of other foci of infection has failed to relieve the condition

5 Cardiac and renal conditions associated with infection of the tonsils should be studied with care before tonsillectomy is advised lest serious results ensue In properly selected cases the percentage of successful results justifies the operation

6 When the operation is well done for the relief of a definite pathologic condition the percentage of successful results is most gratifying

FRENCH K HANSELL, M D

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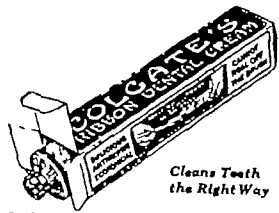
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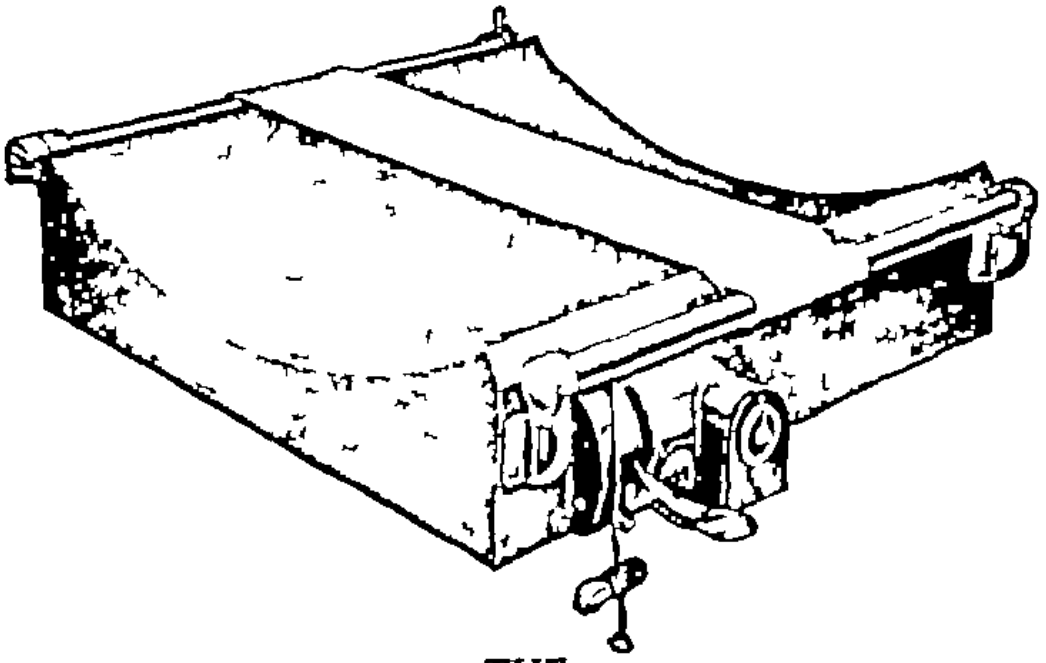
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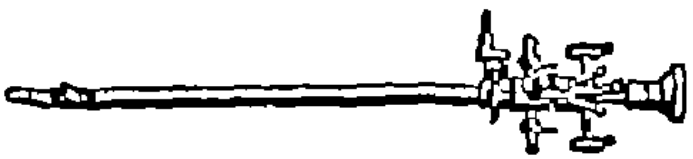
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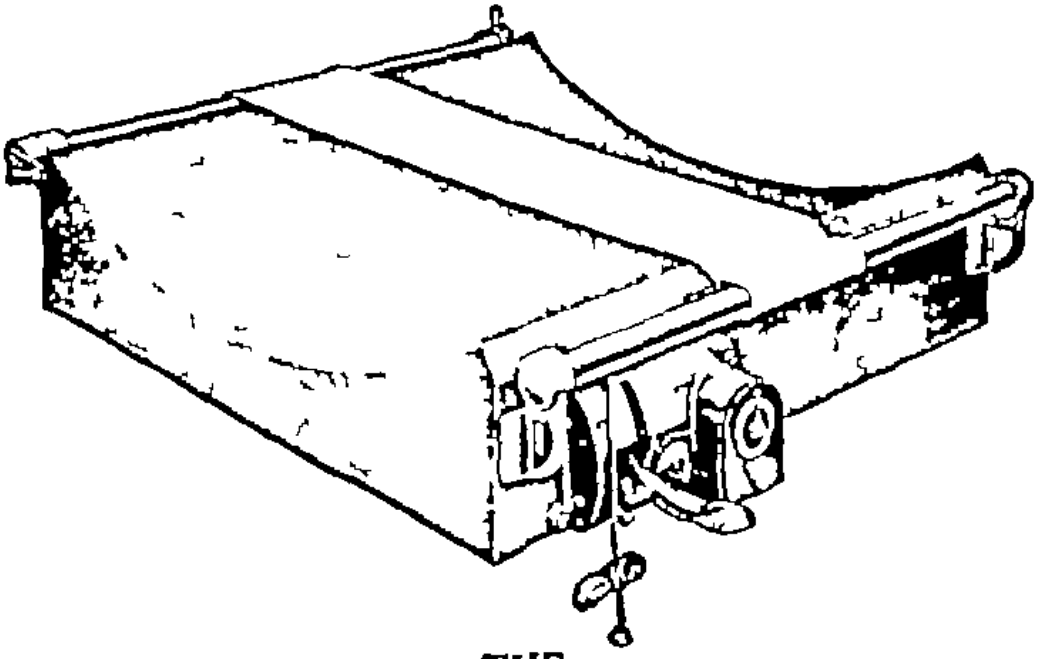
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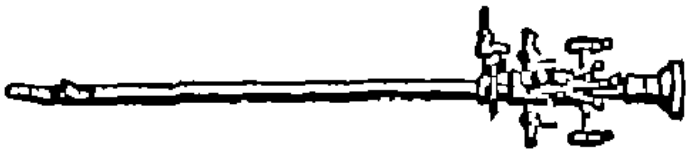
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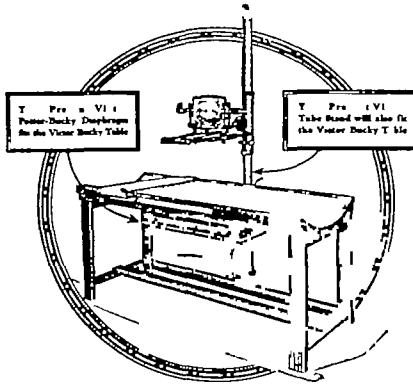


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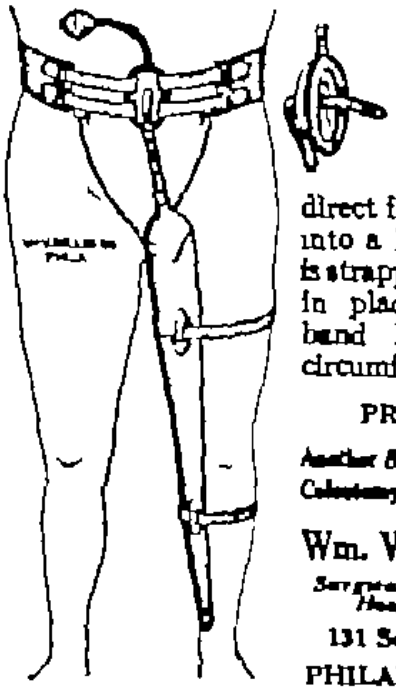
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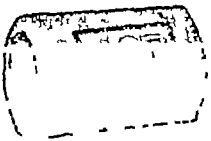
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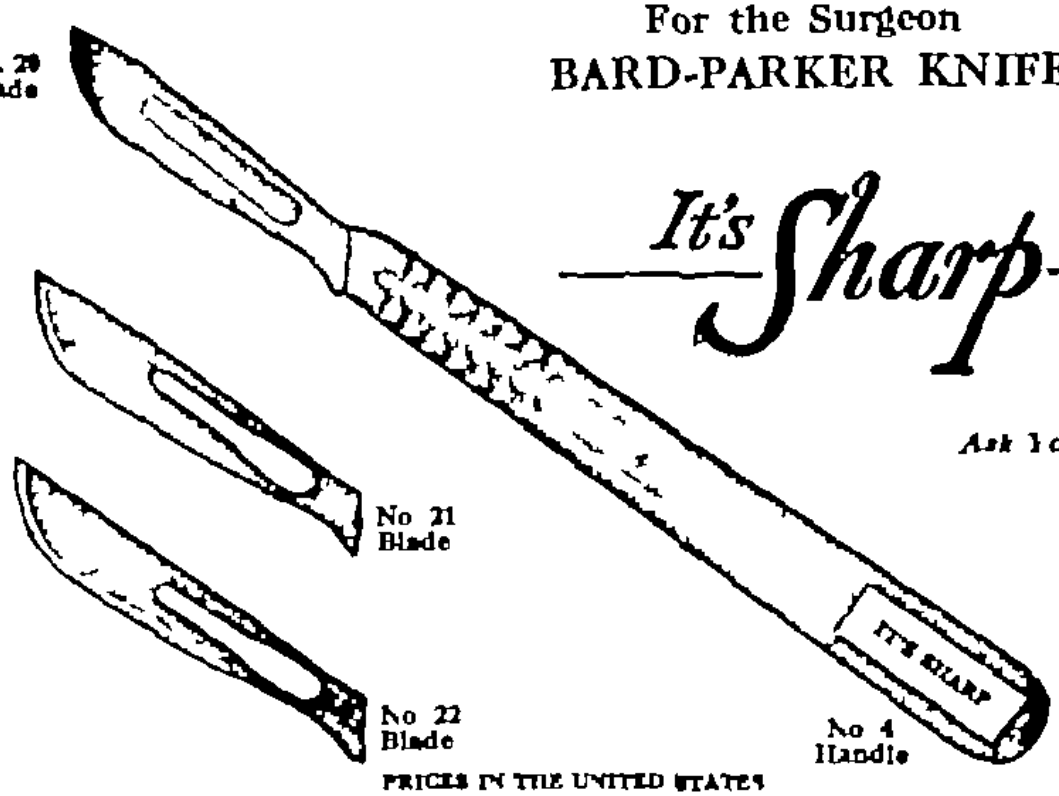
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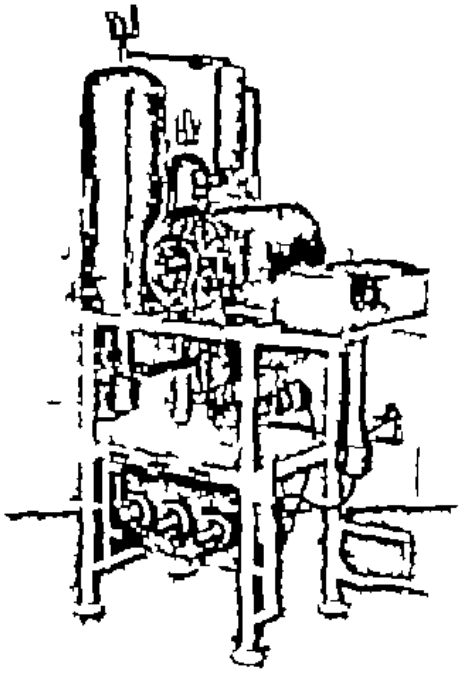
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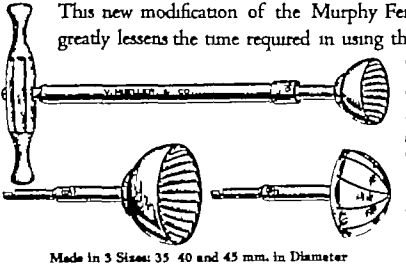
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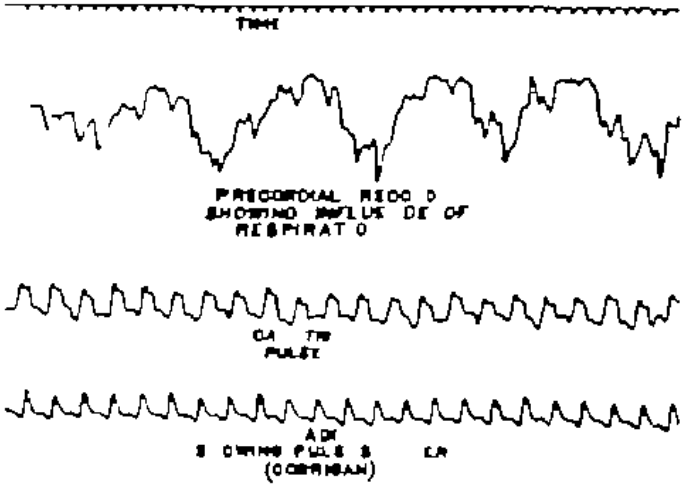
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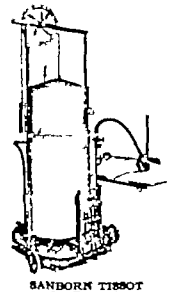
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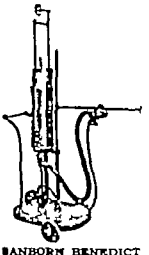
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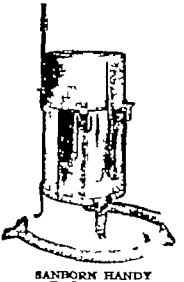
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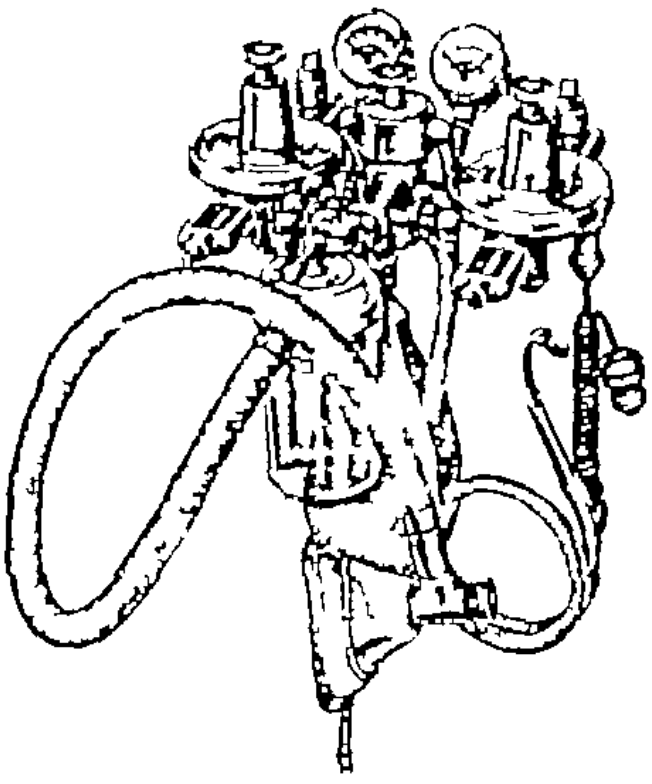
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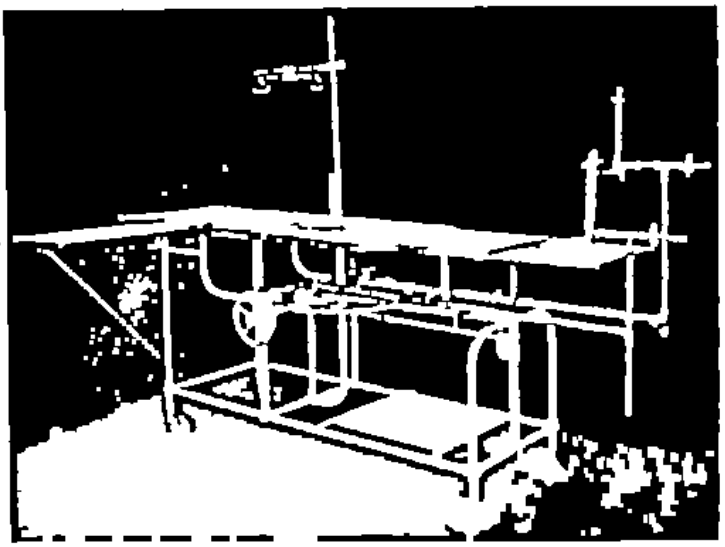
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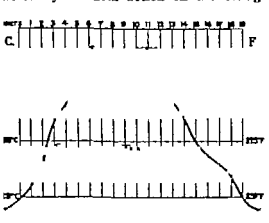


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360	Horsehair	Four 28-Inch Sutures	00
390	Plain Silkworm Gut	Four 14 Inch Sutures	00 0, 1
400	Black Silkworm Gut	Four 14 Inch Sutures	00, 0, 1
450	White Twisted Silk	60 Inches	000 00 0, 1, 2, 3
460	Black Twisted Silk	60 Inches	000, 0 2
480	White Braided Silk	60 Inches	00, 0, 2, 4
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812	10-Day Chromic Catgut	20 Inches	00 0, 1 2, 3
822	20-Day Chromic Catgut	20 Inches	00, 0 1 2, 3
862	Horsehair	Two 28-Inch Sutures	00
872	Plain Silkworm Gut	Two 14 Inch Sutures	0
882	White Twisted Silk.	20 Inches	000, 0, 2
892.	Umbilical Tape	Two 12-Inch Ligatures	

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914	10-Day Chromic Catgut	20 Inches	00 0, 1, 2, 3
924	20-Day Chromic Catgut	20 Inches	00, 0, 1 2, 3
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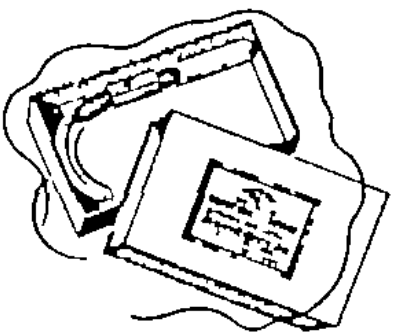
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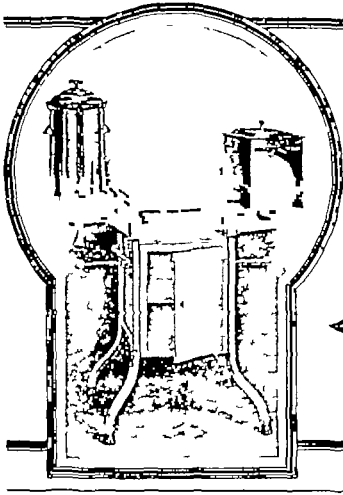
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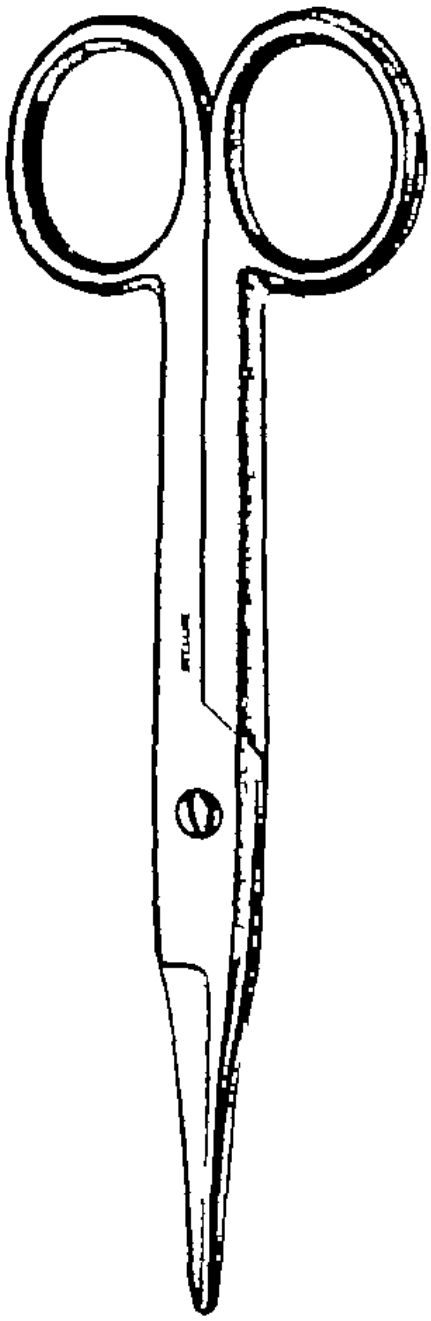
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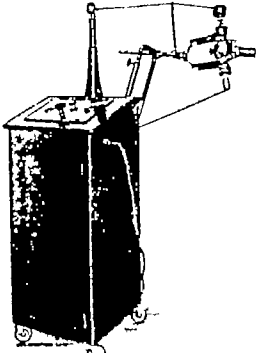
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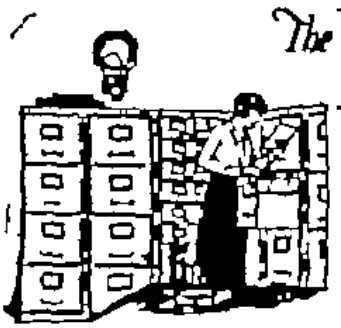
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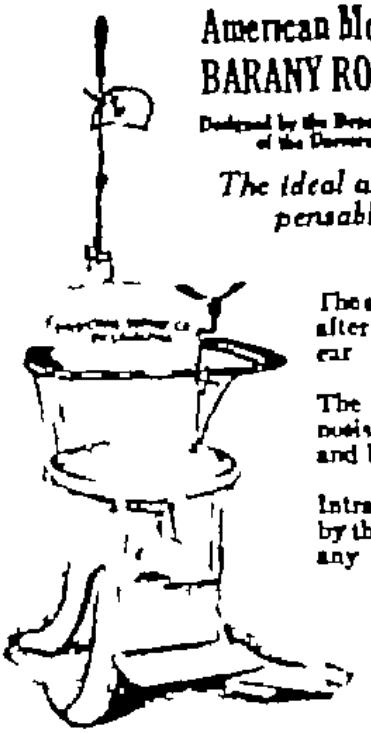
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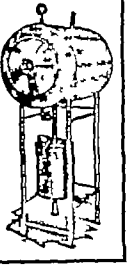
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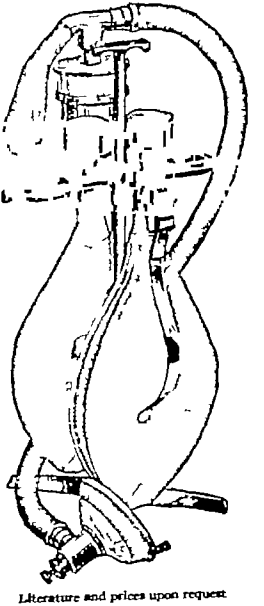
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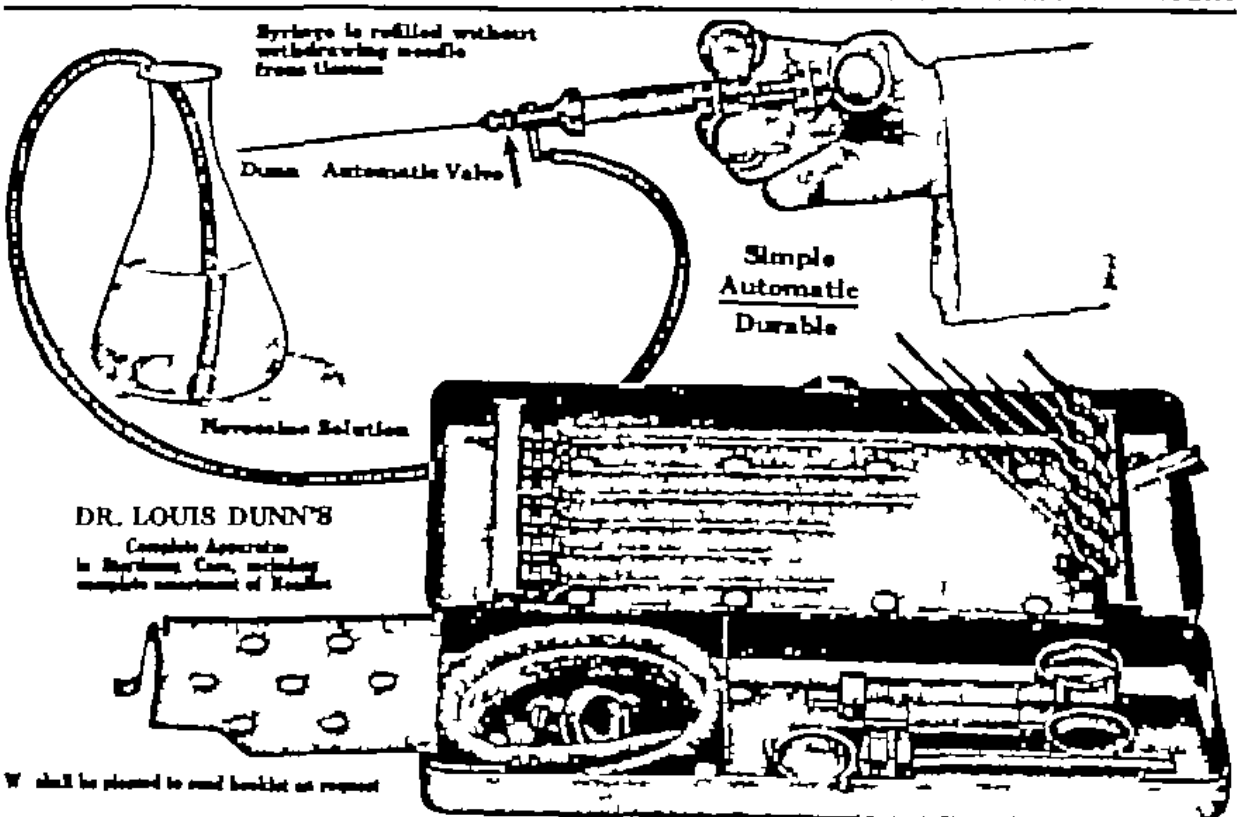
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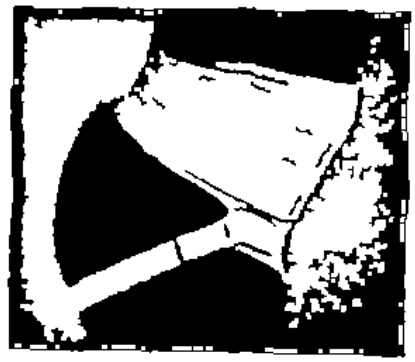
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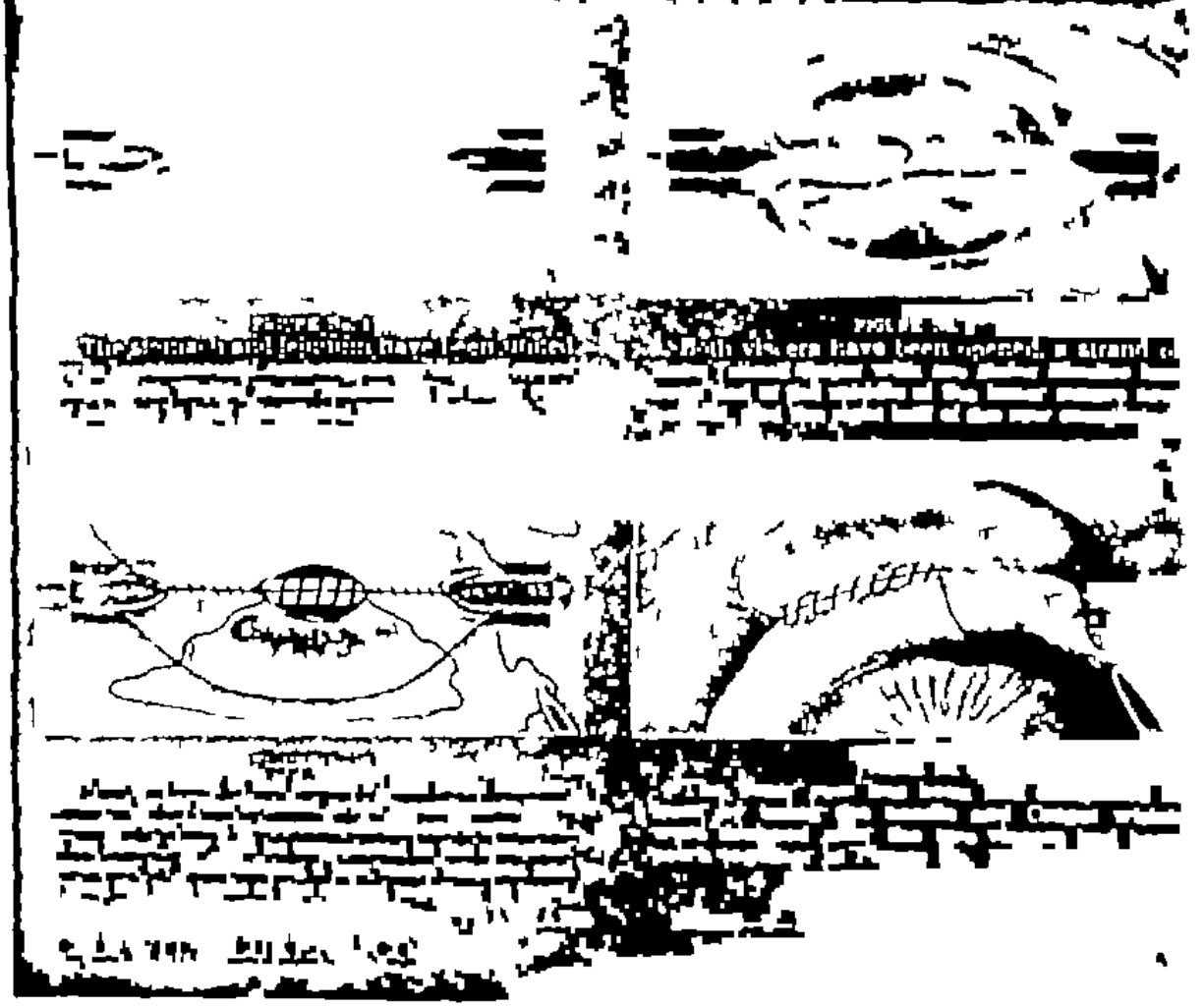
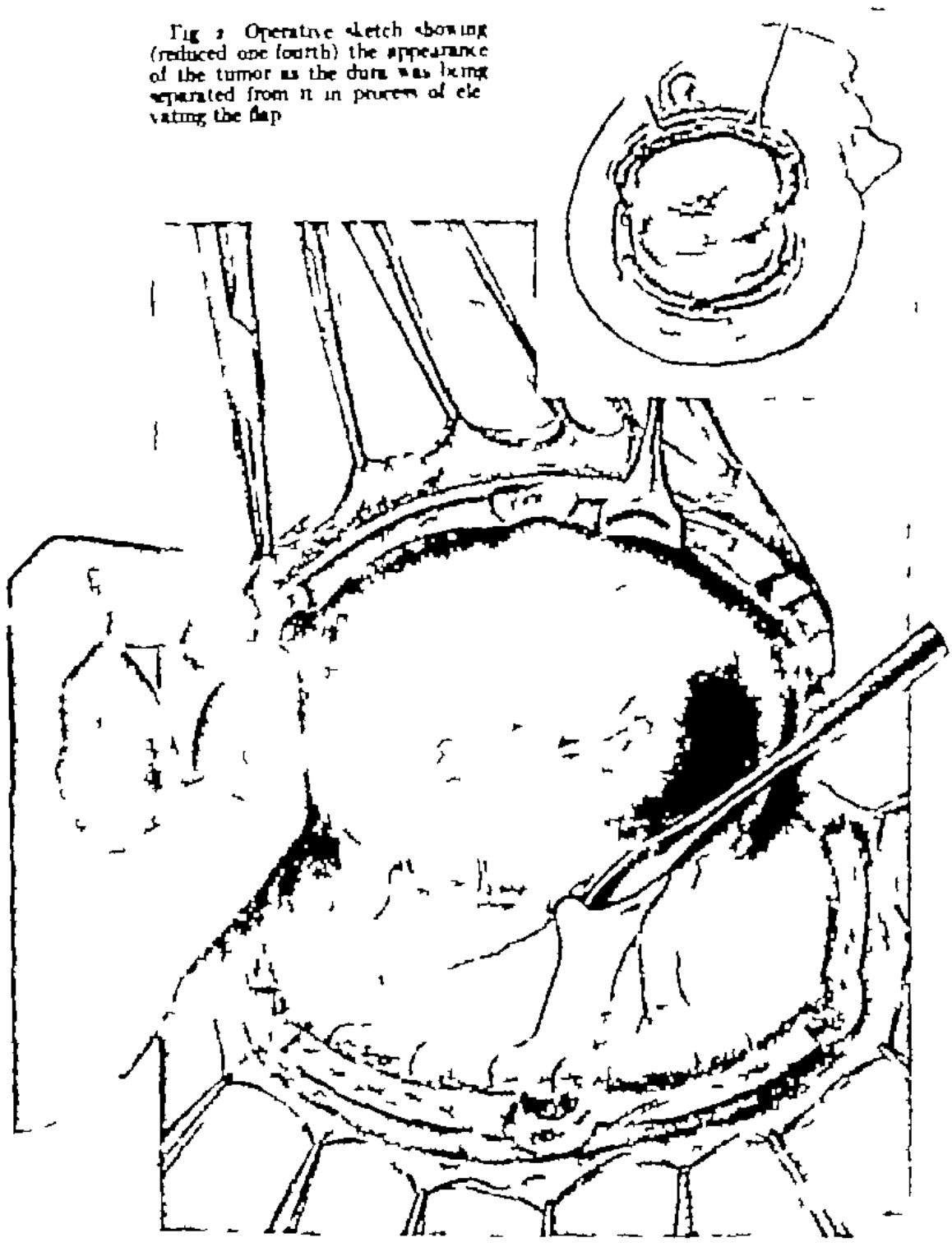


Fig. 2. Operative sketch showing (reduced one fourth) the appearance of the tumor as the dura was being separated from it in process of elevating the flap



Large Epidermal Cholesteatoma of the Parietotemporal Region Deforming the Left Hemisphere without Cerebral Symptoms —Harvey Cushing

SURGERY, GYNECOLOGY AND OBSTETRICS

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A LARGE EPIDERMAL CHOLESTEATOMA OF THE PARIETO-TEMPORAL REGION DEFORMING THE LEFT HEMISPHERE WITHOUT CEREBRAL SYMPTOMS[1]

BY HARVEY CUSHING M.D

Professor of Surgery Harvard Medical School

CHOLESTEATOMATOUS masses in the temporal bone usually ascribed to otitis media desquamativa are not particularly uncommon and in the various journals devoted to otology there may be found from year to year the report of one or more cases They are generally regarded by writers as something apart from the true cholesteatomata or pearly tumors which are encountered elsewhere within the cranium [2] Though from my reading on the subject I am inclined to believe that this view may be erroneous the matter need not detain us, for this presentation is concerned with a cholesteatoma which obviously had no connection with the middle ear [3]

The cholesteatomata remote from the temporal bone are unusual tumors and certain types of them excessively so They are so uncommon, indeed, and excite so much interest when disclosed unexpectedly post mortem, or more rarely in the course of an operation on the brain that they are prone to find their way into medical literature So far as I am aware, the condition has never been diagnosed except at autopsy or operation Certain of these lesions however despite their obscurity should be quite capable of recognition because of the characteristic changes in the bone which the X ray may disclose This was true of the case to be presented

In the history of these tumors there are three names with which all articles on the subject usually begin—those of Cruveilhier of Johannes Mueller and of Virchow—though that of Esmarch possibly deserves to be added to them In his famous *Anatomie*

[illegible]

[illegible]

(xxvi, 6 and 236)

[1] Case presented to the Boston Society of Psychiatry and Neurology at a meeting at the Peter Bent Brigham Hospital, January 20, 1922

Pathologique (1829) Cruveilhier pictured and described one of these tumors which happening to be of the leptomeningeal form with a highly refractile and nodular surface he named *tumeur perlee* Two examples of the same kind of tumor had previously been recorded by Lepreatre and by Dupuytren with sufficient clearness to make them capable of identification. A wax preparation of Dupuytren s case is in the collection of the *Ecole de Medecine*

In 1838 Johannes Mueller[1] described three cases, and gave the name cholesteatoma to the lesions Curiously enough one of them was an example of the exceptionally rare type with which this paper is concerned a tumor which apparently arose in the diploe and involved the upper middle portion of a hemisphere having destroyed the inner table of the skull

Finally in 1855 Virchow returned to the term pearly tumor in an article[2] in which nine cases were discussed two of the temporal bone and three of the basal arachnoid The other four tumors which he included because of their cholesteatomatous contents occurred elsewhere in the body (breast testis etc.) and need not be considered in our present connection

The following year (1856) Esmarch[3] gave a brief account of what appears to have been the first intracranial cholesteatoma surgically treated a tumor of the frontal region the growth having apparently arisen from the bones of the cranial vault.

Since these early papers, such articles as have appeared under the title of cholesteatoma have for the most part been devoted merely to individual case reports though some of the more important of them those for example by Benda by Benecke and by Bostroem enter fully into a discussion of the nature and origin of the lesions

Since von Remak first expressed the opinion in 1854 that these growths were due to epithelial rests a number of different views have been advanced concerning them In his original paper Virchow classified them as heterologous tumors arising in the connective tissue and though it would appear that he regarded them as epithelial he confused contemporary readers by likening them to cancroid Several of his followers (Glaesser Benecke and others) attributed them to an endothelial anlage an opinion which can only be explained on the basis that a variety of tumors with scant regard for their origin or histology whether endothelial epithelial or otherwise came to be called cholesteatomata after Mueller had coined the term for the simple reason that they contained deposits of cholesterin crystals

A familiar example of this is the so-called cholesteatoma of the chorold plexus which Klebs properly regarded as endothelial in origin Though found also in man they are far more familiar to comparative pathologists and the only example I have seen was in the brain of a horse the specimen having been given me by Professor Theobald Smith.

one[4]

Certain of the suprasellar cysts of pharyngeal (Rathke s pouch) origin offer another illustration of the misuse of the term For cholesterin crystals are precipitated in the fluid contents of some of these cysts and though they unquestionably originate from epithelial rests' dating from an early period of development these inclusions are of pharyngeal rather than of cutaneous origin and have fluid contents in place of the fatty mass of desquamated cells of the cholesteatoma proper[5]

All this merely shows how unsatisfactory the term cholesteatoma really is unless all are

Esmarch, F Cholesteatoma im kindesalter Arch f path Anat u Physiol 1856, x, 307 316

G Blumer Bilateral cholesteatomatous endotheliomata of the choroid plexus Johns Hopkins Hosp Rep (Welch Festschrift), 1900, ix, 479 500

agreed to restrict it to tumors of a given type and origin or else to modify the term by indicating whether the growth is endothelial or epithelial in origin

If we confine ourselves to the true epithelial cholesteatomata and to those originating in the the cranial chamber elsewhere than near the ear, they are found to represent only a fraction of one per cent of intracranial neoplasms as a whole In my own series consisting at the present writing of 740 histologically verified tumors, there have been, including the present case, only three examples, so that they represent less than half of one per cent of all tumors This corresponds approximately with the figures given in the tumor series of Tooth of Bernhardt and of others

Two of these cases have already been reported by Dr Percival Bailey[1] as examples of Cruveilhier s "Tumeurs Perlées" The lesion in one of the patients apparently originated between the cerebellum and the roof of the fourth ventricle and gave a definite cerebellar syndrome Dr Bailey was able to find in the literature only eight similar cases, all of them having been postmortem findings In the other patient the lesion was suprasellar situated below and deforming the third ventricle[2]

The characteristic, glistening, mother-of pearl appearance of the surface of a cholesteatoma is seen at its best in the case of these median subarachnoid tumors which have no connection with the dura or bone They are of most variable size and occasionally may attain such dimensions, reaching from chiasm to foramen magnum that their meningeal point of origin cannot be determined

At the time of Dr Bailey's report we had not seen any intracranial cholesteatomata other than those of the Cruveilhier type, but since then two examples of typical pearly tumor' which however, were hair-containing have been met with It is evident, therefore, that these lesions, which beyond question are of cutaneous origin, may arise either from an epidermal or dermal implantation This opinion coincides with that of Bostroem of Giessen who in 1897 published one of the most thorough analyses of the subject He reported two cases of his own, one a true *epidermal* cholesteatoma and the other a hair containing or *dermal* cholesteatoma[3] both of them arising from the leptomeninges

It is important to bear in mind therefore that the intracranial cholesteatomata which show the characteristic mother-of pearl surface may or may not be hair-containing depending upon whether the original epithelial inclusion consisted of the malpighian layer alone, or of the whole skin It would appear from my series that one variety is as common as the other

From what has been said it is evident that the more common situations of the so-called cholesteatomata are (1) in and about the temporal bone, (2) free in the leptomeninges of the cerebral base, (3) in the cerebral ventricles these last being endothelial tumors

In still another situation typical cholesteatomata may occur namely in the bones of the skull at places remote from the middle ear Under these circumstances, as is also true of the tumors encountered by the aurist in the temporal bone the glistening surface of the growth is obscured by its environment Nevertheless, its characteristics gross and microscopic are otherwise the same as in the leptomeningeal tumors These growths judging from the few cases which have been reported appear to be of the epidermoid variety alone They seem to originate between the two tables of the skull the inner table being the first to become ballooned out and absorbed as the growth enlarges Such a tumor is represented by the lesion found in the following case

CASE REPORT

P B.B.H Surgical No 13649 *December 10*
Admission of Mr —— an army officer age 40, an alert active individual with the complaint of slight dragging of his left foot

Family history Excellent except that his mother died from malignant disease

[1] Bailey P Surg Gynec & Obst 1910, xvi, 390-401

[2] Bostroem. Ueber die paralen Epidermoide, Dermoide und Lipome, und dermlen Dermoide Centralbl f allg Path path Anat 1897 iii, -98

Past history Always strong and vigorous with good habits Graduate of a military academy in

life he had had a slight impediment of speech in the nature of a lisp

Present illness It was somewhat difficult to know when this began, if indeed his symptoms may be called an illness He was inclined to date his troubles to the fall from his saddle which occurred in *March 1916* at which time he struck his head and was stunned for a few minutes, but was otherwise not inconvenienced nor was his work interrupted There was no contusion of the scalp

finger *In September 1916* when ordered up for promotion note was made of this condition by the examining surgeon During 1917 he was busy organizing a regiment Apparently he did not always agree with the opinions of his superiors and consequently was regarded as being eccentric.

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physical and mental tests without difficulty and in *July 1918* was sent to France. After 3 months hard work overseas he became much run down He was examined and was said to have a psychoneurosis. Consequently he was relieved from duty sent to a hospital and invalided home

In *November 1918* another X ray was taken which

leave He reported before the expiration of this time was re-examined, again successfully passed all mental and physical tests above the average, and was returned to duty

For the next 18 months he was in active service on the Mexican border but did not stand the heat well during the summer and again became run down At this time he was reclassified and put in Class B by a board of officers but he successfully fought the action of the board and was reinstated

In *September 1921* for the first time he had some discomforts—vague pains in the back of his neck He was again examined and found to have some weakness in his *left* hand and a slight drag of his *left* foot A diagnosis was made of paresis with osteoporosis Three spinal punctures were performed but tests of the fluid were negative A month later he was ordered up for another neuropsychia tric examination and the diagnosis of "paresis" was confirmed and he was recommended for retirement.

For the past month there has been for the first time a slight sense of soreness or discomfort in the region of the cranial defect and he has detected a slight pulsation there

These are perhaps the essentials of the long story told by the patient with a most unusual preciseness and clearness of memory for dates and incidents The general physical and special neurological examinations with the exception of two things were absolutely negative These were (1) the cranial lesion disclosed by the X ray over the left hemisphere mentioned in the history as having been first observed 2 years before and (2) the slight neuromuscular disturbance on the same —the *left*—side of the body He is right handed

There was otherwise nothing Fields of vision eye grounds ears hearing body fluids—all were normal In view of the history interest naturally centered on the patient's mentality but so far as could be determined there was nothing which could be regarded as abnormal A man of strong personality of active mind alert perhaps somewhat impatient opinionated and aggressive he apparently had not always suited his possibly more phlegmatic superiors who regarded him as prone to assume responsibilities before they were allotted to him These traits appear to have occasionally made trouble for him and to have aroused the enmity of certain fellow officers

He had as stated an exceptionally accurate and retentive memory he was co-operative interested made friends easily—in short showed no stigmata of mental deterioration or variation from the normal other than what personality might account for He was inquisitive about his condition rather than introspective and was not at all neurasthenic.

I The changes in the skull (Fig 1) The X ray showed an extraordinary quadrilateral area of bone absorption over the left side of the skull measuring about 3 5 inches on each side resembling on the plate the appearance which might have been left by an old craniectomy The somewhat irregular and wavy outlines of the defect were sharply demarcated

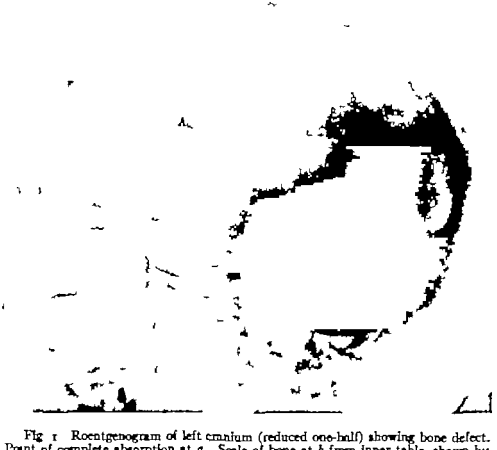


Fig 1 Roentgenogram of left cranium (reduced one-half) showing bone defect. Point of complete absorption at *a* Scale of bone at *b* from inner table, shown by stereoscope to be on edge and well within cranial chamber

and the area showed irregular patches where the bone had undergone almost complete absorption In the center was a small trifolate patch corresponding to the tender spot near the temporoparietal suture where palpation revealed a defect in which there was slight pulsation (Fig 1 a) The external surface of the skull appeared otherwise to be normal Stereoscopic studies showed that the sharply cut margin of the defect had a raised border projecting slightly within the chamber also that there was a thin, isolated scale of bone corresponding to the posterior border of the lesion which stood away from the bone defect perpendicular to the surface and well within the cranial chamber (Fig 1 b)

This appearance could only be explained on the ground that there was a large growth of some kind within the skull but how a lesion of such a size in this situation over the left hemisphere could have produced such a degree of pressure atrophy of the bone without some evidence at the same time of cerebral involvement was inexplicable A lumbar puncture needle was inserted through the small bone defect without finding fluid In its lumen on withdrawal was a little yellowish material which under the microscope resembled degenerated epithelial cells

2 *The positive neurological findings* The slight weakness and awkwardness of the left foot of which the patient complained really amounted to little, but the deep reflexes on the left side were unquestionably more brisk than the right Occasionally an ankle clonus was elicited on this side though never a positive dorsal toe response the character of the left plantar reflex being somewhat obscure

These symptoms homolateral to the cranial defect were a source of confusion before the operation nor can they even now be satisfactorily explained Suffice it to say they disappeared immediately afterward

There were two considerations which made it difficult to decide just what if anything should be done in the way of an intracranial

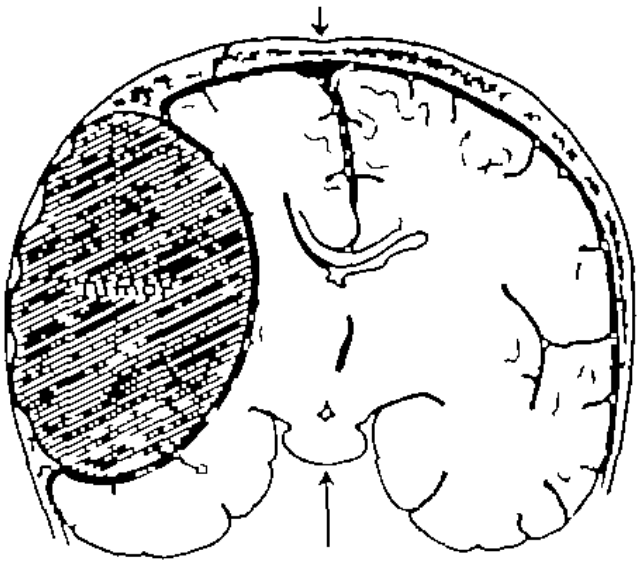


Fig 3 Drawing to scale, representing on coronal section the position of the tumor within the skull (Reduced one half)

exploration In the first place was there in addition to the obvious lesion over the left hemisphere actually a process of some sort in the upper part of the right hemisphere responsible for his left-sided symptoms and increased reflexes? In the second place was there actually a lesion demanding surgical measures on the left side in view of the absence of contralateral symptoms and if so how could it be safely explored without breaking into the area where the skull was greatly thinned? It was finally decided to outline and reflect an osteoplastic flap with a sufficient margin beyond the defect to avoid if possible breaking into it It was felt that, if a large tumor or cyst capable of enucleation should actually be disclosed a most unsightly depression would be left if in the process of its exposure the egg shell area of bone should happen to be damaged

December 14 1920 Operation Osteoplastic resection Disclosure of large cholesteatoma Separation of tumor from dura and skull Complete enucleation Opening of dura with separation of adhesions

no

flap was tilted upward slightly care being taken in



Fig 4 Photograph of patient on discharge to show situation of flap

surface of a tumor It was possible by careful dis-

from the surface of the tumor as the bone flap was

finally lifted up intact from its pocket in the hemisphere covered now by the sagging dura

The growth was very loosely attached to the irregular shallow cup it had made for itself in the bone and was separated without difficulty though during this process the surface of the friable lesion was somewhat fragmented. The outer margin of

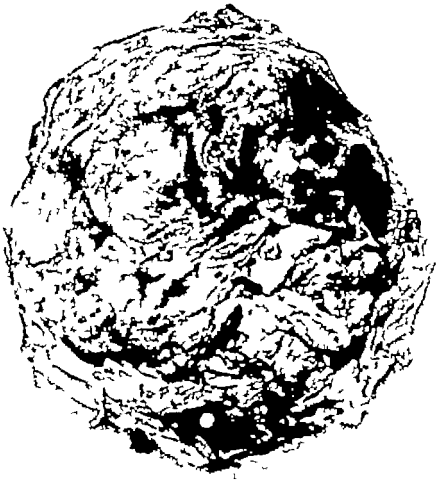


Fig 5 The tumor mass (natural size)

the cup in which it lay consisted of a sharp ridge of bone which projected a few millimeters on to the side of the tumor in its entire circumference accounting for the distinct peripheral shadow in the X ray This ridge was subsequently rongeured away so as not to leave a projecting edge on the under surface of the skull

were easily wiped away The under surface of the bone showed a very much greater degree of absorption than had been anticipated in view of the X ray findings, there being several irregular areas where no bone whatsoever remained but merely a dense membrane.

that in the central portion of the exposed field there was an adhesion between dura and brain Consequently the membrane was incised disclosing a

there being a large vein and two small arteries uniting dura and brain. They were divided between clips the membrane thus freed was closed and floated up with salt solution The bone flap was replaced and closed in layers without drainage A schematic representation showing the size and position of the growth on coronal section is given in Figure 5

Recovery was uneventful. The wound healed perfectly (Fig 4) The symptoms referable to the left side promptly disappeared and were possibly

ry 3
told



Fig 6 Cholesterin crystals and fatty cellular mass from cyst contents



Fig 7 Section of cyst wall (× 250) showing (a) the fibrous zone (b) the zone of epidermal cells, and (c) lamellæ of desquamated epithelium.

tect than in the case of tumors which lie freely in the cranial chamber The outer surface of the growth which lay against the bone has been somewhat fragmented in removal and the scale like masses of desquamated fatty epidermis are somewhat broken apart

Histological note Between the friable lamellæ of fatty degenerated cells arranged more or less concentrically and constituting the central portion of the growth cholesterin crystals are present in great numbers (Fig 6) The thin membranous capsule of the tumor consists of an outer delicate zone of vascularized fibrous tissue whereas the inner zone is made up of four to five layers of polygonal epidermoid cells with normal staining reactions (Fig 7) Keratohyalin granules are demonstrable but no eleidin granules are found The capsule appears to contain no papillæ nor are hairs present in the central mass

As previously stated the cholesteatomata arising from the leptomeninges have usually been unexpected postmortem findings, and most of the treatises which deal with them have been presented by pathologists Their surgical aspects have rarely been considered

Tooth's report[1] of the 500 cases of tumor observed at the National Hospital in Queen's Square gives two examples which had been operated upon by Sir Victor Horsley Both of them were extracerebellar tumors occupying the lateral recess on the right side and they possibly may have been connected with the temporal bone The histological study of the lesion was inconclusive for the tumor mass in both cases was incompletely removed with a spoon and the lining membrane not secured

On the other hand the extradural cholesteatomata which seemingly arise from between the tables of the bones of the skull as in the case here reported have not infrequently been subjected to operation and with the exception of the early reference to an occipital cholesteatoma by Johannes Mueller the few cases in the literature seem to have been reported by surgeons. The operations have not been particularly satisfactory ones as the tumor mass has usually been entered through

1 Tooth, Howard The treatment of tumors of the brain and the indications for operation T XVII International Congr Med (London, Sect 161-187 (Cases 244 245)

the bone defect and the complete eradication of its lining membrane has been rendered thereby well nigh impossible Though a more extensive search might reveal additional case reports, those of which I am cognizant are as follows

1 *Eswarch s frontal case*[1] A fluctuating slowly growing tumor of hen s-egg size in the left frontal region of a man age 24 present for 14 years Both tables had become completely absorbed and the tumor was surrounded by a sharp bony edge and presumably originated in the diploe The tumor was operated upon Fragments of its inner membrane were incompletely separated from the dura The cavity was packed Recovery

2 *Weinlechner s frontal case*[2] A man of 45 who had received a blow on the forehead at 8 years of age A tumor developed producing epilepsy Two operations were performed the first was followed by suppuration The tumor had led to a small area of pressure absorption of the outer table and extensive absorption of the greatly distended inner table Drainage recovery

3 *Weitruba s frontal case*[3] A man age 22 with a right frontal tumor of goose-egg size deforming the right eye and causing severe headaches The overlying bone had become absorbed and at the base of the large tumor cavity the internal table was likewise largely absorbed The cholesteatomatous mass was scooped out through the defect but the inner membrane adhering to the dura could only be removed in fragments Drainage recovery

4 *Blecher s frontal case*[4] A 24 year-old workman had as a child received a blow on the left side of the head in the parietal region A local swelling developed which in time enlarged to the size of a hen s egg and became soft and fluctuating It was demarkated by a sharp bony edge It produced headaches There was no pulsation. At the operation the central mass was scooped out leaving a large cavity lined with a bluish white skin which by pincers and curette could only be incompletely removed piecemeal from its attachments to the dura Recovery

5 *Borchardt s occipital case*[5] A 36-year-old workman had received a trifling scalp wound in the occiput. Headaches followed and shortly after a palpable defect was observed in the occipital bones It was tender but without pulsation It produced general pressure symptoms with choked disc and a cerebellar localizing syndrome. Operation revealed a large extradural cholesteatoma weighing 90 grams

6 *Koerner s occipital case*[6] A man of 41 had for years suffered from suboccipital headaches A semi fluctuating swelling developed low in the left side of the occiput in which one could feel the margin of a bone defect Operation revealed a large cholesteatoma whose contents were scooped out Recovery

These few cases abstracted here including my own show three frontal two parietal and with Mueller s case three of the occipital region There are a few other cases referred to in the literature, the original reports of which have not been identified Such for example is Pfannenmueller s case mentioned by Bergman as occurring in the temporal region[7], and also Benda s cerebellar case reported in 1897 before the Berlin Medical Society

These cases constitute a group of true epidermal cholesteatomata which are extradural and appear to originate between the two tables of the skull The tables become separated thinned by pressure, and finally absorbed the inner table as a rule suffering more than the outer In all former instances the cystic mass has been intentionally opened early in the operation and as Blecher remarks the extirpation of the growth *in toto* is impossible under these circumstances owing to the fact that the membrane adheres to bone and dura which makes a recurrence probable Unquestionably the removal of the epidermal membrane is the crux of the procedure and this can only be accomplished before the cyst is emptied of its contents and its enveloping membrane permitted to collapse Incomplete removal of the lining wall is doubtless the explanation of the recurrences so common after operations by otologists for the cholesteatomata of the temporal bone which come almost solely into their province

To summarize It may be said that the cholesteatomata or pearly tumors proper arise from epithelial implantations which occur in the development of the embryo They are seen in their most typical form in the leptomeninges more commonly between the cerebellum overlying the fourth ventricle and in the infundibular region They also occur in the cerebellopontile recess and in the Sylvian

Loc cit 856

[1] Reported at a session of the K K Gesellschaft der Aerzte in Wien Wien klin Wchnschr 889, Feb 4 No 7 p 96

Ueber ein Cholesteatom im Stirnbein Wien klin Wchnschr 1889, Nov p 889

Ueber Cholesteatome (Epidermoid) der Schaedelknochen Deutsche Zschr f Chir 903 lxx, 552-56

Cholesteatom der hinteren Schaedelgrube Arch f klin Chir 905, lxxvii, 852-859

Ein Cholesteatoma verum in der hinteren Schaedelgrube Zsche f Ohrenheilk 900 xxxvii, 352

Pfannenmueller Inaugural Dissertation Giessen 896 (not verified).

cleft. These epithelial implantations may be either epidermoid or dermoid Hair-containing tumors when arising in the leptomeninges may have all the external characteristics of the typical pearly tumor of Cruveilhier

The epidermal cholesteatomata relatively common in the petrous and mastoid portions of the temporal bone are in all probability of the same nature for precisely similar tumors may be found elsewhere in the skull over frontal parietal and occipital regions distant from the temporal bone As the inner table of the skull becomes absorbed these tumors though remaining extradural may attain a large size and come to deform the brain greatly

They are capable of recognition by the X ray owing to the associated bone defect and are capable also of complete surgical removal if approached by a flank rather than direct attack in order that the epidermal membrane may be peeled from the dura This desideratum is hardly possible if the central mass is primarily opened through the defect thereby permitting the delicate lining membrane of the sac to collapse

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THE PRESENT STATUS OF OPERATIVE OBSTETRICS REFERRING TO THE ABUSE OF CÆSAREAN SECTION[1]

By JOHN OSBORN POLAK M Sc M D F A C S and A C BECK M D Brooklyn

THE operative furor has surely invaded obstetrics when even the physiological processes of normal labor are disturbed and a normal sized child in normal position passing by a normal mechanism through an ample pelvis with dilatable soft parts is interfered with the head disengaged a version done and delivery accomplished by breech extraction on the plea that the woman is saved an hour or two of second stage pains

Other enthusiasts either for their own convenience or to save the woman an hour or so of suffering are routinely applying forceps when the head has reached the ischial spines and the cervix is fully dilated while others have so widened the indications for cæsarean section that this operation is being employed daily on patients who present no real obstetric indication for it simply because it is the most convenient way to get the baby out

It is the purpose of this brief paper first to review the present status of operative obstetrics and to show that there is a difference between surgical obstetrics and obstetric surgery done for justifiable indications second that routine operative intervention even in the hands of the expert, is not free from danger to both mother and child and finally that while cæsarean section is the easiest and quickest method of delivery there is a higher *morbidity* and a higher *mortality* following abdominal hysterotomy than follows abdominal section generally in properly selected cases

First let us study the operative incidence in a series of a thousand consecutive cases which have had intelligent and painstaking prenatal study—where each labor is conducted with a full knowledge of existing conditions, on the principle of aseptic intelligent expectancy and where intervention is done not withheld on proper indications, solely in the interest of the mother or the child—and then let us compare these with 1 113 cases delivered by one man an acknowledged expert, who has deliberately interfered with the normal processes of labor as a routine procedure

In this series of a thousand cases there were 106 patients with actual contraction of the pelvis an incidence of 10 6 per cent 344 in which the occiput was posterior at the beginning of labor and 42 cases in which the presentation was abnormal These included 27 breeches—6 face or brow 4 transverse 4 sets of twins and one complex presentation with

[1] Read before the Clinical Congress of American College of Surgeons, Philadelphia, October 16, 21

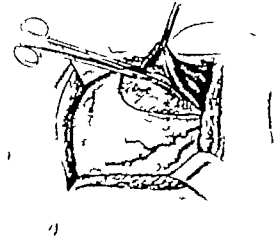


Fig 1 Modified Kroenig cervical cesarean section. Separation of bladder from anterior face of uterus.

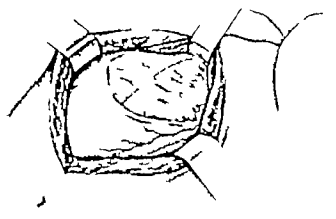


Fig 2 Modified Kroenig cervical cesarean section Bladder retracted area for incision exposed

the head and cord presenting, yet in this series the incidence of operative intervention was as follows

Forceps deliveries—low and median	22
Version—internal or bipolar	5
Induction of labor—by bag	4
Manual conversion of face into a vertex	2
Perforation of the after-coming head	1
Cleidotomy	1
Cesarean section	8

This gives an incidence of forceps of 2 2 per cent an incidence of version of 0 5 per cent, and an incidence of cesarean section of 0 8 per cent The number of stillbirths in this series was 19 or 1 9 per cent, including all of the infants dying within the first 2 weeks after delivery—6 more deaths should be added making a total infant mortality of 25 in a thousand cases, or 2 5 per cent

Compare these statistics with those published in the *transactions of the Association of Obstetricians Gynecologists and Abdominal Surgeons* for 1920 by one of the most skillful surgical obstetricians in America

During the year ending August 31 1920 he personally delivered 1 113 women on whom he performed 920 versions 39 forceps operations, and 80 cesarean sections, or approximately one cesarean in every 14 cases—10 women were so far advanced in labor when they were first seen that they could not be prevented from delivering spontaneously, and 12 babies were born before the attendant reached them

In this series 41 were stillborn, and 34 died before the mother was discharged from the hospital, making a total fœtal mortality of 75 or 6 7 per cent or nearly three times the mortality rate of the infants of the previous series referred to Such facts leave no room for argument, they clearly demonstrate the contention that I made at the beginning of this paper namely that routine operative intervention even in the hands of the expert is not free from danger to both the mother and the child

Operative obstetrics no longer recognizes the induction of premature labor in contracted pelves for it is admitted that induction is not free from danger the increased danger of infection is actual not fanciful and complications as premature rupture of the membranes malpositions of the fœtus prolapse of the hand or cord do occur Furthermore operative intervention is required to terminate labor in a very large number of the cases (54 per cent of bag cases) this necessarily subjects the child to greater danger not only because of its prematurity but because it is subjected to unnecessary manipulation

Present day obstetric teaching recognizes the propriety of giving each case an aseptic test of labor when the pelvic deformity falls within the relative class, for over 80 per cent of these cases (8 out of 10) spontaneously deliver, or can be terminated after the head has reached the spines by low forceps

High forceps is an operation of history its high fœtal mortality and the frequent incidence of severe maternal injuries have

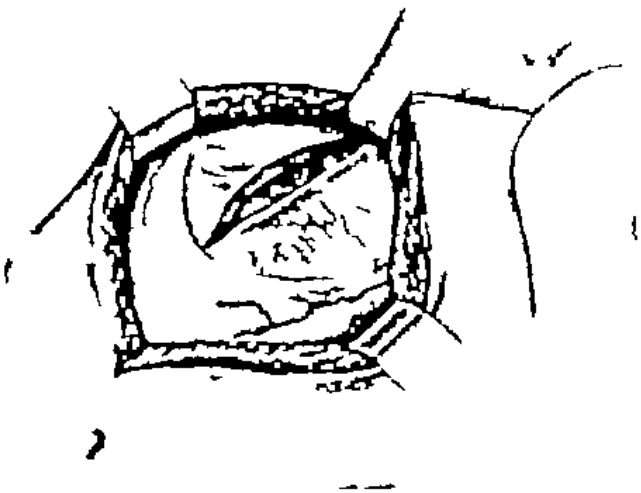


Fig 3 Modified Kroenig cervical cesarean section Showing the location of the incision in the lower uterine segment

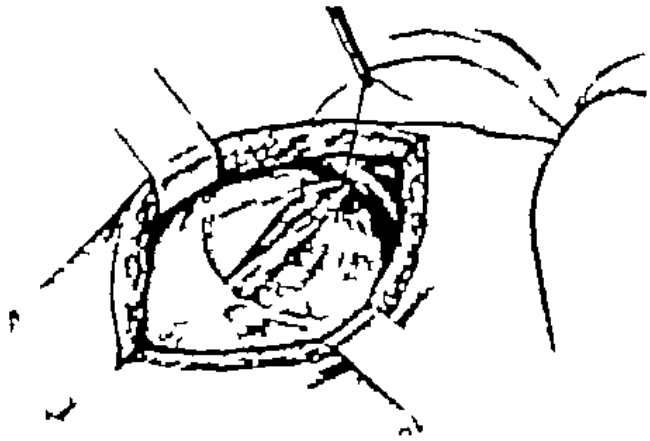


Fig 4 Modified Kroenig cervical cesarean section Closing the uterine incision with a running suture of the muscle

caused the procedure to be relegated to the atrocities of the past On the other hand low forceps applied with the head at or below the spines, is an operation which when indicated is purely life saving

Proper attention to the action rhythm and rate of the fœtal heart after the membranes have ruptured and the head has passed through the cervix into the vagina will give notice to the observing accoucher as to when a low forceps delivery should be employed for many children lose their lives as the result of too conservative a delay during the perineal stage

Low forceps applied under surgical anesthesia, with the patient in the proper posture does little or no damage to the pelvic soft parts (in the hands of a competent man)

Version according to the technique perfected and so ably described by Potter has a wider field than has been generally given it *but not as an elective routine procedure in normal cases* While the majority of occipitoposterior positions of the vertex will spontaneously rotate to the front if the head engages and reaches the pelvic floor and the powers are sufficient (possibly without increasing the risk) This tedious mechanism may many times be avoided by a timely version Version, however has its widest indication as an emergency procedure in complex presentations —brow face and the accidents such as prolapsed cord placenta previa, abruptio pla centæ where rapid delivery is demanded in the interest of the child

In present day obstetrics embryotomy has but a limited field and is now practically never done on the living child except in the presence of an infected mother and even here the Porro operation may come into competition if there is strong necessity of delivering a living child On the other hand perforation cleidotomy and evisceration should have a more general use in terminating the delivery of the dead fœtus.

CÆSAREAN SECTION—ITS ABUSES

There seems to be a fallacious impression in the minds of both the general medical and lay public, that cæsarean section is a perfectly safe and simple operation which can always be guaranteed to give perfect results under all circumstances. They evidently forget the fact that *abdominal surgery always carries with it a certain risk to the life of the patient* even in the most competent hands and under the best conditions Hence instead of being chosen as the operation of election after careful consideration because it is the safest and best method of delivery for the patient cæsarean section is looked upon by many poorly trained obstetricians and general surgeons who do consultation obstetrics even though they do not pretend to have a working knowledge of fundamental principles of the obstetric art as a panacea for all ob

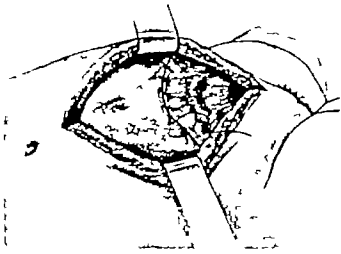


Fig. 5 Modified Kroenig cervical cæsarean section. Uterine incision in the lower segment covered with bladder reflection Sutures being placed.

stetric ills—presumably the ease with which the operation can be performed by the average abdominal surgeon is the prime factor in the choice of suprapubic delivery in improper cases for as compared with the ordinary obstetric operation except perhaps an easy low forceps, cæsarean is the easiest method of delivery for the obstetrician and the safest operation for the child

Notwithstanding this general impression our study of the results in 2,200 operations of which 200 are from our own clinic shows that cæsarean has a *greater morbidity and mortality than the ordinary abdominal operation* done for other pelvic conditions

The development of the aseptic technique in surgery has made it possible to consider the rights of the child as well as the rights of the mother, hence in modern obstetrics, abdominal hysterotomy done under proper conditions by a competent operator has been used in the interest of the child as an elective procedure in preference to some of the mutilating operations

It may be performed as an operation of election when a thorough examination demonstrates the fact that the child will be subjected to serious danger, in case an attempt is made at pelvic delivery or that the health of the mother is likely to suffer seriously as a result of such a pelvic delivery These conditions warrant the somewhat increased risk that attends an abdominal operation

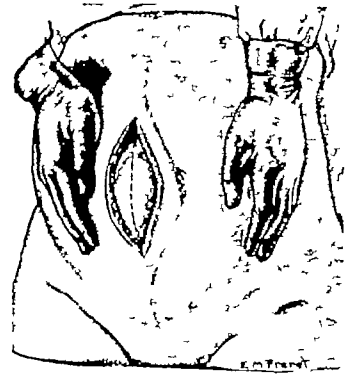
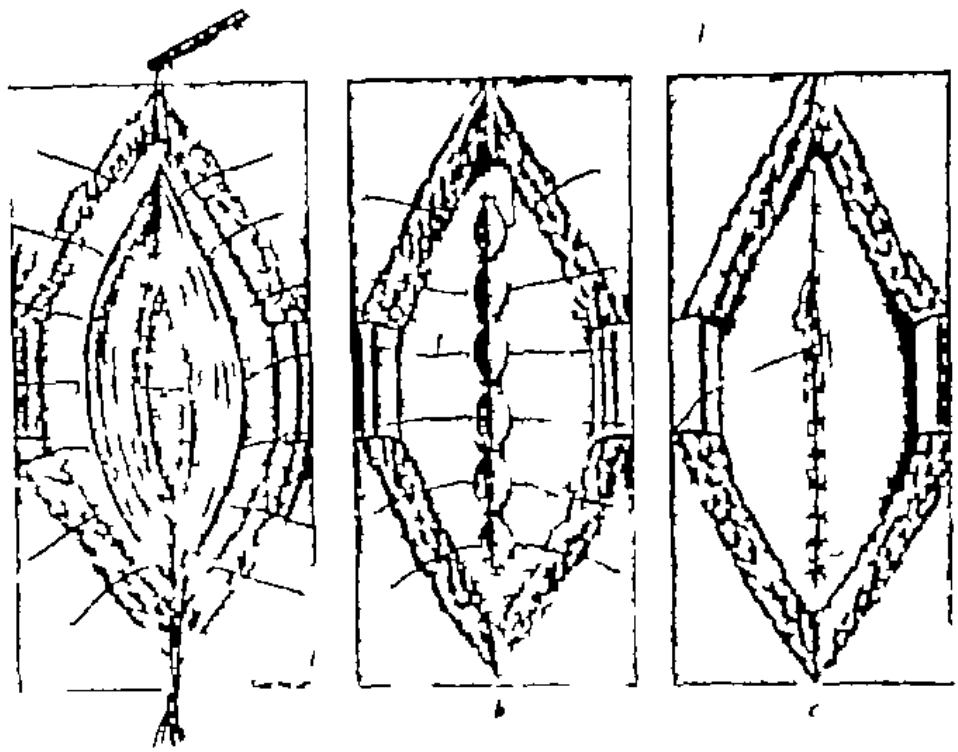


Fig 6 Classical cæsarean section Showing how the assistant crowds the uterus into the abdominal incision by pushing the uterus upward and forward with the hands on the sides of the abdomen.

Study of the end results shows that those obtained by cæsarean section performed at the time of election that is before labor begins or early in the course of labor are much better than the results of the late or secondary operation This therefore *implies the necessity of very careful prenatal study the proper estimation of the relative size of the child to the particular pelvis and the aseptic conduct of the labor* so that if the operation is indicated it may be performed at a time when the best results may be expected for both patients

Unfortunately in general practice prenatal study receives very little consideration, and most labors are conducted with questionable asepsis and repeated vaginal examinations It is common knowledge that the majority of pregnant women are allowed to enter upon labor without any preliminary examination the attendant having no accurate knowledge of the relative size of the pelvis or fœtus or of the position of the fœtus, hence section is done not as an operation of election, but as an operation of the last resort often after



the patient has been subjected to repeated vaginal examinations which always open an avenue for infection or after attempts have been made at infrapelvic delivery These cases are potentially infected and therefore when section is done it is attended with a morbidity or mortality higher than should be present in properly selected abdominal cases

Several operators can show a series of 100 or more consecutive sections without a fatality but from a study of several thousand case reports where the operation was done by the best operators we feel certain that their mortality will come as it has come to others

While these surgical obstetricians have widened the indications for the use of this procedure so that they include almost every conceivable difficulty the obstetric surgeon is limiting the indications in both his practice and his teaching placing its election on well grounded indications

Broadly speaking the indications for abdominal delivery may be classed as those that are absolute and those that are relative Cesarean section is indicated in the patient in whom some definite pelvic obstruction exists either as a result of actual contraction or by the presence of tumors blocking the pelvis which renders delivery *per vaginam* even of a dead or mutilated fœtus either impossible or so dangerous that abdominal delivery is attended by less risk to the mother

A contracted pelvis with a true conjugate of 6 or 6½ centimeters or an immense child will give the absolute indication This is admitted to be the only absolute indication for operation and any operator who performs cesarean for other reasons must be sure that the benefits which are to be expected from the operation both for the mother or the child are sufficient to warrent the increased risk to the mother s life

In the relatively contracted pelvis cesarean is considered only with a view of saving the life of the child for in dystocia from this cause embryotomy may safely deliver from below This leads us to the one question that should always be considered *is it proper to*

Group I—Clean Cases
Sections 8
Maternal deaths 6
Mortality percentage 0
Group II—Potentially Infected Cases
Sections 1260
Maternal deaths 78
Mortality percentage 6
Group III—Frankly Infected Cases
Sections 530
Maternal deaths 61
Mortality percentage 1 5

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mg points

	(b) Hours ruptured
4 Vaginal examinations	
5 Total number made	In hospital
	By physician
	By midwife
	On the outside
6 Number of hours in labor	
7 Type of operation	(a) Classical
	(b) Transperitoneal
	(c) Porro-Supracervical
	Hysterectomy
8 Diagnosis	Condition demanding cesarean
9 Puerperium	Highest temperature
	Day postpartum on which it occurred
	Number of days above 100 4
	Febrile—classes as febrile when temperature was 100 4 or more for 96 hours
	Cause of morbidity
Condition on discharge	

add that increased risk to the woman in order to save the child

My own feeling is that the healthy unborn child has equal rights with the mother, provided she is not potentially infected yet we cannot blind ourselves to the fact that the woman is assuming an increased risk when she agrees to abdominal delivery

The further admitted indications may be stated as follows Labors in multiparæ who have had previous obstetric disasters may be terminated by section, unless the present child is manifestly smaller than the previous children have been or the previous disaster can be traced to the faulty judgment or poor operative skill of the former attendant.

Placenta prævia as an indication for abdominal delivery has its advocates We teach and practice it when the patient is at or near term, in good condition and has not been subjected to vaginal invasion with a live child and a central or nearly total implantation of the placenta Unfortunately these conditions rarely obtain for the average patient with central placenta prævia has usually lost considerable blood and has had careless and unaseptic measures used for the control of bleeding so is potentially or actually infected and is necessarily a bad operative risk

TABLE III—THE EFFECT OF VAGINAL EXAMINATIONS ON MORBIDITY

No vaginal examinations, labor being conducted by abdominal and rectal palpation	
Total cases	97
Febrile cases	28
Morbidity	28 8 per cent
Vaginal examinations were made	
Total cases	96
Febrile cases	30
Morbidity	32 per cent

These have again been divided into those in which all of the vaginal examinations were made in the hospital under strict aseptic precautions and those in which the vagina was invaded on the outside prior to admission

Vaginal examinations in the hospital	
Total cases	63
Febrile cases	20
Morbidity	4 5 per cent
Vaginal examinations on the outside prior to admission	
Total cases	3
Febrile cases	3 1
Morbidity	7 1 8 per cent

TABLE IV—THE EFFECT OF RUPTURE OF THE MEMBRANES ON MORBIDITY

	Not ruptured	Ruptured
Total cases	100	87
Febrile cases	34	44
Morbidity percentage	32	50 5

TABLE V—EFFECT OF HOURS IN LABOR ON MORBIDITY

Operated on early in Labor	
Total cases	83
Febrile cases	20
Morbidity percentage	3 3
Operated on late in labor	
Total cases	53
Febrile cases	23
Morbidity percentage	43

Since Petersons' exhaustive paper on cesarean in *eclampsia* the operation has been frequently used to empty the uterus in eclampsia, while we occasionally employ it in the pre-eclamptic toxæmia when eliminative treatment has failed to relieve the toxic symptoms and the obstetric conditions either in the bones or soft parts make infrapelvic delivery difficult and dangerous

We cannot, in the light of present day statistics and the results obtained from the Stroganoff treatment, feel that abdominal delivery saves many more lives

Abruptio placentæ is a proper though rare indication and then only when the birth passages are totally unprepared In addition to these, the indication for section has been extended to breech presentation with large

TABLE VI.—MATERNAL MORTALITY

Causes of death	
Peritonitis and septicemia	8
Hemorrhage	
Eclampsia	4
Postoperative shock	
Postpartum pneumonia	
Total deaths	12
Mortality percentage	8

8 deaths in 200 cases

If we deduct the four deaths due to eclampsia there are eight deaths in 96 operations or a mortality of 8 per cent

TABLE VII.—ANALYSIS OF MORTALITY IN CLEAN CASES AND IN THE POTENTIALLY OR FRANKLY INFECTED CASES

Clean cases conducted in the hospital in which only rectal examinations were made or where no vaginal examination was done except for purposes of observed	
Total cases so conducted	48
Deaths	0
Mortality percentage	0 0
Potentially or frankly infected cases which had been handled on the outside prior to admission to the hospital	
Total cases	43
Deaths	7
Mortality percentage	16
All cases of both classes	96
Deaths	
Mortality percentage	4

TABLE VIII.—STILLBIRTHS

[illegible]	11
	1
	—
Total	9

Total fetal mortality in 100 operations including those babies dying before leaving the hospital or 5 5 per cent

CESAREAN SECTIONS

Incidence of Section in Long Island College Hospital Series
8 in 1000 or 1 to 125

Incidence of Section in Johns Hopkins Hospital Series
9+ in 1000 or 1 to 110

Incidence of Section in Potter's Series
71+ in 1000 or 1 to 14

INFANT DEATHS

Long Island College Hospital Series
25 in 1000 or 1 to 40

Potter's Series
67 3 in 1000 or 1 to 14 8

foetus in elderly primiparæ prolapsed cord with ruptured membranes, large child and unprepared soft parts to the delivery of the physically unfit, and in cardiacs to lessen the strain of labor also to women in labor after previous cæsarean sections because of the danger of rupture of the hysterotomy scar for delivery in the presence of obstructive pelvic tumors or dystocias resulting from previous suspension operations which have become uterine fixations and in deliveries after the cervix has been amputated and the pelvic structures repaired by extensive plastic operation

In order to demonstrate that there is actually a greater morbidity and mortality in cæsarean than attends ordinary abdominal sections and that therefore the indication should be definite and the operative conditions favorable we have undertaken an analysis of twenty two hundred cases Two thousand of this number represent the abdominal deliveries in some of the leading obstetric clinics in America and two hundred are taken from the case records of the maternity service of the Long Island College Hospital from September 1 1912 to September 1 1921

In the first group owing to the incompleteness of the data supplied we have been unable to do more than compute the mortality rates.

In the series taken from the records of our own service we have been able to make a more careful analysis and make a study not only of the mortality but of the morbidity incident to section.

In the first group of 2,000 sections collected from other clinics (Table I) we have divided the cases into the following classes

1 The clean case—under this head we have included all of those elective cæsareans, where the operation was done before labor or soon after labor had begun and in which no vaginal examinations had been made

2 The case potentially infected—in this class will fall those patients who have had a test of labor with ruptured membranes and those who have been subjected to repeated vaginal examinations by physician or midwife prior to entering the hospital

3 The frankly infected cases or those which have been long in labor with ruptured membranes careless and repeated vaginal invasions having had futile attempts at delivery before admission to the clinic.

The 200 cases of cæsarean occurring in the maternity service of the Long Island College

Hospital, were carefully reviewed, and the foregoing tables are based on the results of this study (Tables II to VIII)

Though it may be said that our series is too small from which to draw conclusions we feel sure that the morbidity in cæsarean is vastly greater than is found in the ordinary clean abdominal sections

If one thinks for but a moment that the uterine wound leads directly to an infected field, it is surprising that more lives are not lost.

Our bacteriological studies of the flora of the postpartum uterus, which have lately been confirmed by Loeser, show that on the fifth and sixth day, the majority of puerperal uteri contain pathogenic organisms, which have migrated into the uterus through the open cervix from the vagina. These, therefore, are brought in direct contact with the suture line just at the time when if there has been any defect in technique such a faulty hæmostasis, sutures tied too tightly or carelessly placed the wound may become inoculated, and the infection spread along the suture line This and the admirable culture ground offered by the placental site, are to our mind the reasons for the high morbidity even in clean cases

SUMMARY

A careful perusal of the foregoing statements and of the appended tables must leave the impression in the mind of the reader—

That surgical intervention is being too freely employed to terminate labor and furthermore that the results for mother and child from such interference (oftentimes unindicated) with the physiological processes of labor do not justify their employment

That the adoption of the principle and practice of *aseptic intelligent expectancy* in labor, when the factors of labor are known to be normal or approximate the normal, is still the safest method of delivery not only for the mother but for the fœtus

That there is a high morbidity even in the *clean* cæsarean section very much higher in fact than is common in operations for pelvic tumors such as fibromyomata and ovarian cysts This is due to the presence of infective bacteria in the cavity of the puerperal uterus which migrate from the vagina to the interior of the uterus through the open cervix

That even in expert hands there is a definite maternal risk from cæsarean section, greater than is generally known Our mortality studies show that this ranges from 2 9 per cent to 14 per cent, depending on the time in labor at which operation is done after rupture of the membranes and on the amount of vaginal invasion present.

And finally, in view of these facts, we feel that every pregnant woman should have greater prenatal study and care than is commonly given her so that complicating conditions may be recognized prevented, or corrected before labor and where this is not possible the knowledge gained from this study will permit the obstetrician to conduct the labor in such an intelligent and aseptic manner, as to minimize the dangers from abdominal delivery

TRAUMATOLOGY OI THE CARPUS

By A. H. BIZARRO M D F R.C.S (Eng) London
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THE surgical importance of a well defined knowledge concerning the traumatic conditions of the wrist is obvious. An early diagnosis of conditions leads to an early appropriate treatment on which the cure so much depends Very often the so-called sprains synovitis arthritis of several kinds rheumatism of the wrist are diagnosed a long time after a possible and almost forgotten trauma such as some of the several conditions that I am bringing forward in this article There are 123 cases of carpal injuries in this series which have been collected from cases of my own and of the Royal Herbert Hospital These cases are much more common in practice than our traditional knowledge leads one to think The injuries have been grouped into (a) fractures of a single carpal bone, and (b) associated carpal lesions

FRACTURE OF THE SCAPHOID

There were 68 cases of fracture of the scaphoid or 55 per cent of the total number of carpal injuries These have been divided into fractures with and without extrinsic synostosis

Scaphoid fractures without extrinsic synostosis (Diagrams I and II *1 to 55*)

MECHANISM OF FRACTURE

	Cases	Number of figure Diagrams I and II
Fall on the hand	41	
Fall on the thumb	1	35
Sprain	4	3 38 41 49
Back fire of motors	3	8 21 41
Crushed wrist		7 33
Fall of weight on the wrist		19 48
Boxing punch on the wrist	2	2 42
	55	

The ages of these individuals were distributed as follows

	Cases
Between 10 and 20	9
Between 21 and 30	21
Between 31 and 40	19
Between 41 and 50	5

These cases were seen as follows

	Cases
[illegible]	27
	4
	13
	4
	2
	1
	54

Thirty-eight cases were of the right and 17 of the left hand Three were in females and 52 in males. In one case of fracture of the right scaphoid the left os magnum was equally damaged

Scaphoid fractures with extrinsic synostosis There were 13 cases, as represented in Diagram III and Figure 1 which shows the ages and dates when these cases were seen. In 12 cases the fracture was due to fall on the hand and in one Diagram III *5* to the back fire of a motor

An analysis of these 68 scaphoid fractures reveals a great variety of types of injury which can be grouped into *incomplete* and *complete fractures* The first are usually seen at the upper border of the scaphoid and seldom at its concavity—(Diagram I, *1* to *12*) The complete fractures may be seen with or without separation of the fragments and the absence of the synostosis of the intrinsic type is the rule among these cases even if they are seen months or years after the injury The direction of the crack or diastasis is to be seen at the head waist, or neck, and very seldom at the tuberosity of the bone (Diagrams I and II *13* to *55*) In some cases there is marked comminution of the fragments (Diagram II *26*) which is even better seen in the lateral roentgenogram of the carpus, and usually is to be noticed at the back of the wrist as a dust of bone.

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placement is to be seen in some cases in the anteroposterior roentgenogram (Diagram I and II *13 14 30*) In some rarer cases

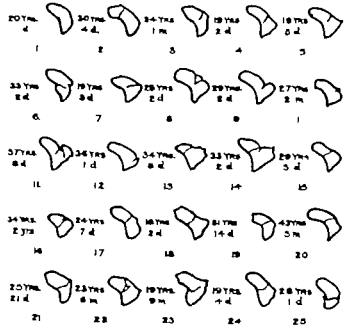


Diagram I Twelve incomplete, *1* to *12* and 13 complete scaphoid fractures, *13* to *25* Notice in this and in the following diagrams the ages of the patients (upper figures) and the time elapsed after the accident (lower figures) are given at the left hand side of the drawings.

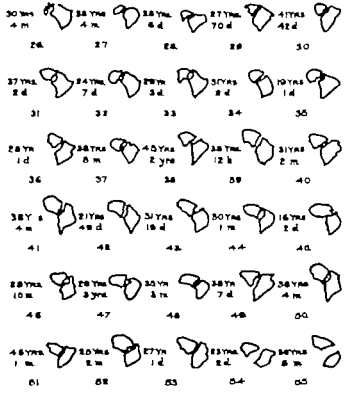


Diagram II. Thirty complete scaphoid fractures.

there is a compression of the fragments, besides the split in the bone (Diagram I *16, 25*) In Diagram I *16* the compression is not accompanied by luxation as in *25* where the lower fragment is crushed behind the upper The more marked navicular luxations are to be seen when there is an associated carpal lesion such as in case of retrolunar luxation of the os magnum, etc.

I have divided the synostosis into *intrinsic* and *extrinsic* The first variety is seldom seen and corresponds usually to a prolonged period of immobilization of the wrist after the trauma (Diagram I *22*) The average cases however are as shown (Diagram II *38 42 46*, *47*, etc.) where several months and years have elapsed after the accident and yet the fragments remain completely "pseudarthrosed Occasionally there is an attempt to union in one or more points of the line of fracture (Diagram II *43 51*) which can be called incomplete union Usually a mass of granulation tissue forms between the fragments which is shown by the cases operated upon

The *extrinsic variety of synostosis* is commonly met with and does not necessarily mean either too long a period of time elapsed after the accident (Diagram III *2 10*, and *12*) or too long a period of wrist immobilization as a means of treatment. The commonest type is the union between the distal navicular fragment and the radius This occurred in 70 per cent of the cases (Diagram III, *5* to *13*) The next common type is where the distal navicular portion synostoses with the os magnum (*Diagram III 2 3 10, 12,* and *13*) The proximal scaphoid fragment occasionally is synostosed with the radius or semilunar (Diagram III, *1*, *4 12* and *13*) and the distal fragment more rarely still may unite with the trapezium or the trapezoid (Diagram III, *11* and *12*) The degree of functional disability is usually proportional to the extent of the synostosed areas, of which (Diagram III, *13*) is a good example showing a severe degree of fusion accompanied by marked local swelling pain and limitation of movement. It is remarkable however that some cases display a great impairment of function not withstanding an apparently slight lesion as was the case in Diagram II, *38* in which there was no synostosis of any kind The age general condition rheumatoid diathesis neurasthenia, eagerness in claiming compensation are all factors of great importance. It will be noticed that there was not among

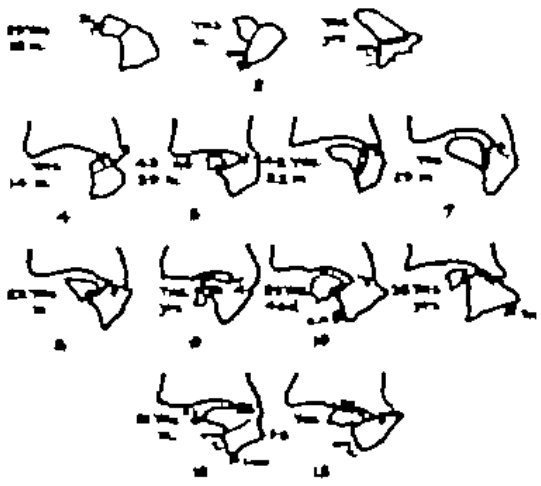


Diagram III Thirteen complete scaphoid fractures and the varieties of extrinsic synostosis

these patients a good example of cuneiform fracture of the navicular tuberosity as in one of Blau s and Eisendrath s cases nor any longitudinal type of crack along the bone as described by Guibout

2 a *Fractures of the semilunar* There were two cases only—1 5 per cent of the carpal lesions One showed a vertical incomplete crack at the upper border of the bone and the other was a case of compression fracture with cuneiform synostosis The former was due to a fall on the palm and the latter to a kick from a horse

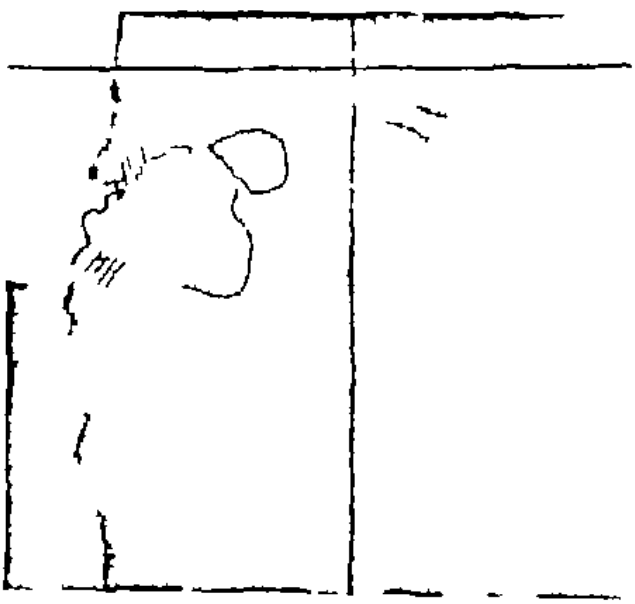


Fig 1 This is the same case as represented in Diagram III, 11 It is given here to make clear Diagram III

3 a *Fracture of the os magnum* There were 6 cases 4 9 per cent, Diagram IV These fractures were due to falls on the palm of the hand were all incomplete and in 50 per cent of the cases were seen at the inner border of the neck of the bone (Diagram IV 1 to 3) in two cases the split occurred at the outer border and corresponding to the point of articulation with the scaphoid tuberosity just above the capitotrapezoid ligament (Diagram IV 4 and 5) and in one case it was a simple crack at the postero-inferior angle of the os magnum (Diagram IV 6) These cases were seen stereoscopically and this was confirmed by the lateral roentgenogram and in some cases the opposite wrist was X rayed as well The last case above mentioned was not an os magnum secundum but a real crack In one case of left os magnum fracture the right scaphoid was fractured as well (Diagram I 13 and Diagram V 3)

4 a *Fracture of the unciform* There were four cases, 3 2 per cent, as in Diagram V In three cases (Diagram V 1 to 3) the crack occurred at the outer border and inferior angle of the bone corresponding to the surface where the strong capito-unciform ligament is inserted In one case (Diagram V 4) the uncus was fractured at its base, and the roentgenographic appearance was peculiar showing a marked downward digression of the shadow of the uncus in the palmar view They were all cases of fall on the palm

ASSOCIATED CARPAL LESIONS

1 b *Scaphoid and radius* There were seven cases, 5 7 per cent as shown in Diagram VI They were all due to falls on the hand excepting Diagram VI 6 which was due to a back fire These cases produce very distressing symptoms The radius in two cases (4 and 5 Diagram VI) was broken as in Malle s fracture. In two other cases the crack (1 and 2 Diagram VI) occurred at the articular radial end only In one case only the radial split corresponded to the navicular diastasis (Diagram VI 1 and Fig 2) but in two the

der of the styloid only of which 5 Diagram

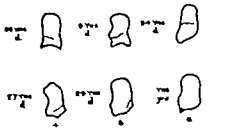


Diagram IV Six incomplete fractures of the os magnum.

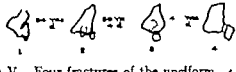


Diagram V Four fractures of the uncIform 4 repro-sents a fracture of the uncIform process.

VI, is a more advanced condition. The case represented by *4* Diagram VI is, as it were the continuation of what happened in cases represented by *1* and *2* In *7* is shown a case of epiphyseal separation with backward luxation of the distal fragment and some navicular comminution In none of these patients was there a fracture of the radial diaphysis as in Beck s case

2, b Scaphoid and ulna There were three cases of real ulnar fracture (Diagram VII, *2 4* and *5*), and two cases of ulnar styloid division This division is in the case represent ed by *1* in Diagram VII, a typical ' ulnare antebrachii," and in *3*, one rare example of congenital non fusion of the styloid os triquetrum secundum In *2* is shown a fracture of the styloid tip and in this case the bony fusion is well marked in contradis-tinction with the congenital cases where there was a well-defined and straight gap In cases shown by *4* and *5* in Diagram VII there was a fracture of the lower ulnar end In the last case the ulna was luxated backward as well and the fall was due to a motor bicycle collision In one case not represented in this series there was an associated fracture of both radius ulna, and the scaphoid resembling Rutherford s case There was not any fracture in this group resembling Potherat's

3 b Scaphoid and semilunar (fracture and dislocation) There were eleven cases of com bined lesions In *4* cases the naviculolunar contact was the seat of a crush which involved and compressed the contiguous portions of the two bones. In two of the above named

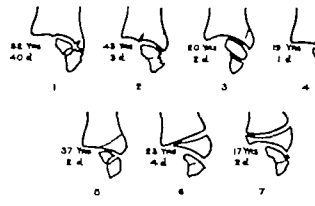


Diagram VI Seven combined naviculoradial fractures.

cases there had been a back fire and in the two remaining one fell on the palm of the hand and the last sustained the fall of a heavy object on the wrist In *3* cases there was a fracture of the navicular head or body and crushing of the semilunar at the points of contact with the scaphoid and radius Two of these cases were due to crushing of the wrist by heavy objects and in the third the lesions were due to a severe sprain In one case there was radiolunar synostosis

In another case due to a fall on the palm of the hand there was a total compression injury



Fig 7 This is the same case as represented in Dia gram VI, *1*

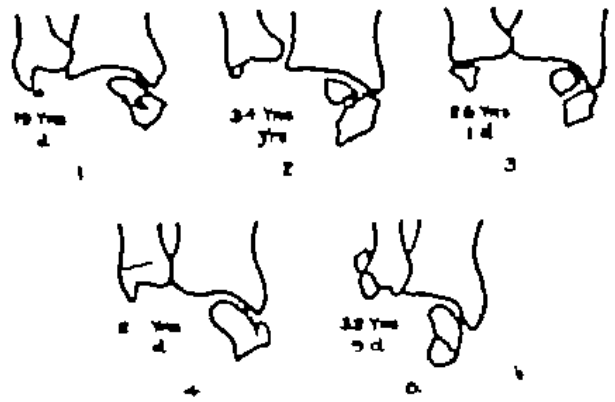


Diagram VII Three combined radio-ulnar fractures (2 3 and 5) associated navicular fracture and ulnare antebrachii" (1) and associated navicular fracture and (?) "trapetrum secundum (3)

of the semilunar which was perpendicularly luxated forward and the fracture of the scaphoid waist was accompanied by intrinsic and extrinsic synostosis.

In the last three cases (Diagram VIII 1 and Figs 3 4 and 5) the lesions are even more complex The first case shows a dislocation forward of both scaphoid and semilunar The scaphoid was the seat of a crack slightly above the waist which was confirmed at the operation In Figure 4 is represented a case seen 33 months after resection of the semilunar and proximal scaphoid fragment which had been performed 3 months after a back fire This roentgenogram shows a marked

a fall on the hand in extension The semilunar is luxated forward and is the seat of marked calcareous atrophy The ink lines shown in the roentgenograms were drawn after a careful stereoscopic search The proximal scaphoid fragment is luxated backward This was a

of the left hand

4 b Scaphoid and cuneiform There were two cases as shown in Diagram IX. Both resulted from falls on the hand and the lines of the cuneiform fracture are in one case 1 Diagram IX an incomplete vertical crack and in the second 2 Diagram IX a transverse complete fracture. In this case the distal navicular fragment was synosto-sed with the radius

5 b Scaphoid and trapezium There was one single case of fracture of the navicular waist and compression fracture of the navicular tuberosity and trapezium This was due to a fall on the palm of the hand in a girl aged 19 years.

6 b Scaphoid and os magnum There were four cases shown in Diagram X 1 to 3 and the last not included there being like 3 as far as the os magnum is concerned but slightly higher than the level of the navicular crack. The fracture represented in 1 was due to the passing of the wheel of a car over the wrist, and in that represented by 2 to a back fire which produced a complete transverse crack of the os magnum neck The other two were due to falls on the palm of the hand This type of os magnum fracture and those far the Robert. of great

rarity

7 b Scaphoid and unciform There was one case due to a fall on the palm of the hand The scaphoid fracture was comminuted at the waist and the unciform was cracked as in Diagram X 1

8 b Scaphoid semilunar and radius There was one case due to a fall on the hand. The radial fracture resembled that seen in Diagram VI and the naviculolunar lesion was one of compression and comminution at the zones of contact between the bones.

9 b Scaphoid semilunar and ulna There were two cases (Diagram VIII 2 and Fig 6 16) Both were due to falls on the palm The former displays a divergent fracture luxation of the semilunar and proximal scaphoid segment, and os magnum unciform fusion The latter is a case in which both the semilunar and the proximal navicular portion are reluxated forward In both cases the ulna fracture i located at the styloid process.

10 b Scaphoid semilunar and os magnum There were two cases due to falls on the palm In Diagram X 5 is represented a fracture compression at the scapholunar junction a vertical crack on the radial surface of the

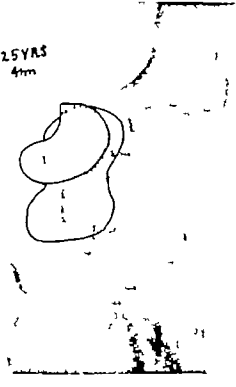


Fig. 3. Lateral view of same case represented in Diagram VIII 1

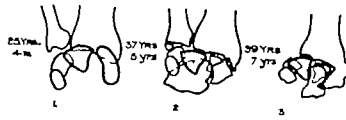


Diagram VIII Three cases of semilunar displacement or backward dislocation of the os magnum 1 represents an associated luxation forward of the scaphoid 2 an associated dislocation backward of the proximal scaphoid fragment, fracture of the ulnar styloid, and os magnum unciform fusion and, 3 an associated backward luxation of the proximal scaphoid portion, cuneiform fracture indentation of the os magnum. In these last two cases there is extrinsic radial synostosis of the proximal navicular fragment Note the triangular outline of the semilunar and the extent of its cuneiform superimposition

semilunar and the os magnum showed a small oblique crack in its lower border The second case is represented in Diagram VIII, 3, and it shows a luxation forward of the semilunar backward dislocation of the navicular proximal fragment an os magnum crush at the point of contact with the navicular tuberosity, and a very marked scaphoradial synostosis of the distal segment The semilunar was not in any of the cases of this series fractured in several places (Peste) or fractured transversely as in Hunt's case.

11, b Scaphoid semilunar os magnum, and unciform There was one case due to a fall on the palm and seen 18 years after the accident (Fig 7) There are very marked secondary changes in the radius a luxation forward of the semilunar a fracture and extrinsic radionavicular synostosis, and a crack through the unciform and os magnum where motion apparently took place

12 b Scaphoid trapezoid and os magnum There was a case as shown in Diagram X 4 and due to a fall.

13 b Os magnum and trapezoid There was one case, Diagram XI and due to a fall on the palm of the hand

14, b Os magnum and unciform There was one case seen 3 months after a fall on the palm of the right hand which showed impaction between the articular surfaces of both bones

15, b Os magnum and metacarpals This was the case of a woman 28 years of age who fell on the dorsum of the hand It proved to be an incomplete crack of the os magnum as in Diagram IV, 1 and an oblique fracture of the bases of the third and fourth metacarpals which ran downward and inward

16 b Trapezium and metacarpal This was a fracture of the internal and inferior angle of the trapezium and a small crack at the outer border of the base of the first metacarpal The fall took place on the thumb flexed on the palm of the hand

17 b Cuneiform pisiform unciform and metacarpal This was the case of a fall on the ulnar border of the wrist There was a fracture of the cuneiform similar to that shown in Diagram IX 1 an oblique crack of the pisiform a fracture of the ulnar border of the unciform running upward and outward and an oblique crack at the inner border of the base of the fifth metacarpal The lateral roentgenogram revealed numerous fragments of bone at the level of the carpal damage

18 b Carpal fusion This was the case of a very severe crushing injury penetrating to the carpus (Fig 8) The wrist was ankylosed in a position of 15 degrees of palmar flexion There was very marked metacarpophalangeal rigidity Figure 9 is a roentgenogram of the

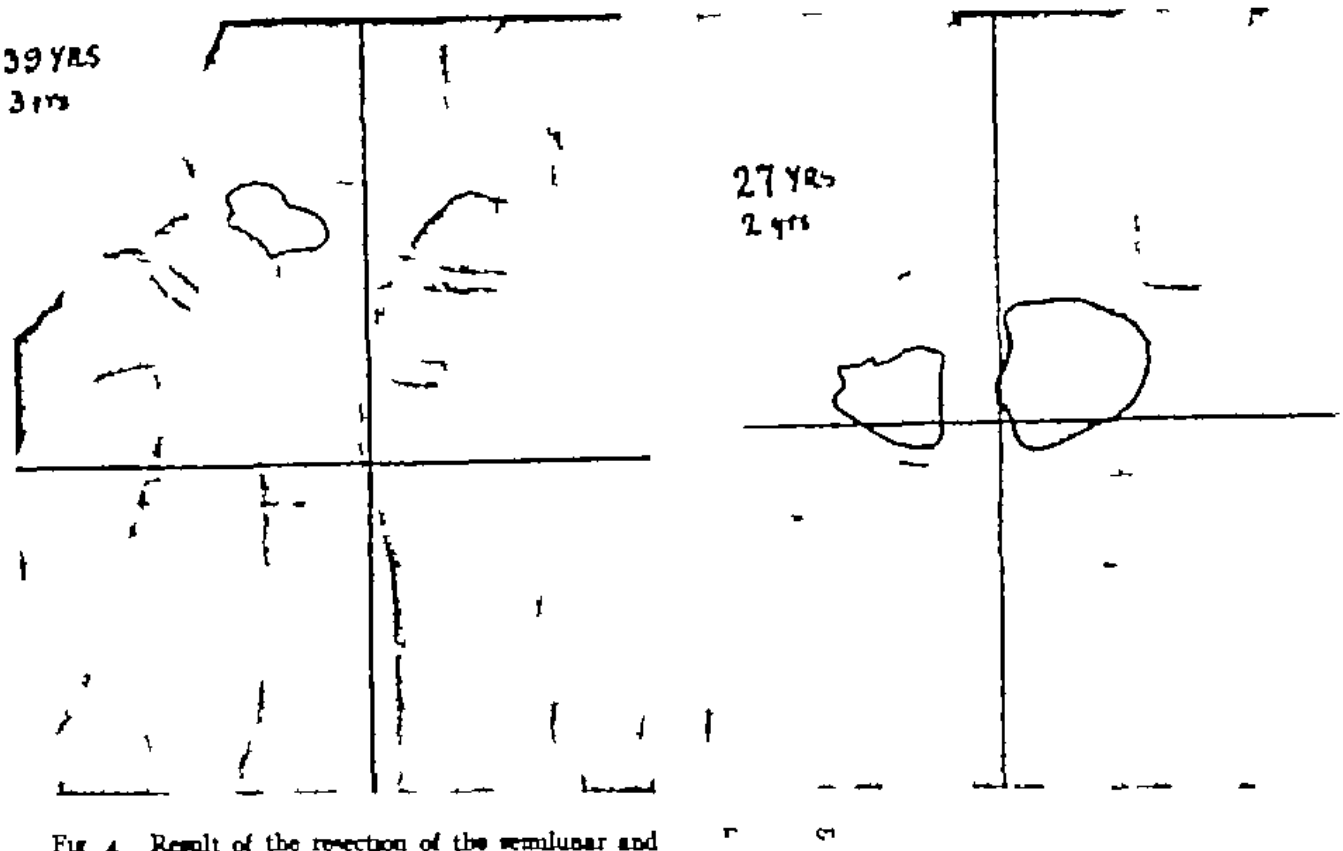


Fig 4 Result of the resection of the semilunar and proximal navicular fragment 33 months previously Note secondary changes in os magnum and radius

same wrist taken 30 days after the operation for mobilization and with the hand kept in extension to the end of a Thomas arm splint Figures 10 and 11 show the degree of motion obtained 3 months after operation

An analysis of the *histories* given by the cases above referred to shows that a fall on the hand is by far the commonest mechanism of fracture The fall usually takes place as described by one of the cases (Diagram II *39*) a doctor as follows I was thrown from my motorcycle and landed on my hands, striking the kerb with the palmar aspect just below the wrist I have examined the new pair of gloves he was wearing at the time, and by the erosion in the leather it can be said that the fall was on the hypothenar eminences with the hands adducted In some cases it is the thenar eminence that strikes the ground. The fall on the dorsum of the hand occurs in a few cases, and in a fewer number still on the metacarpal heads with flexed thumb or fingers The direct type of injury—fall of weights on the wrist, crushing injuries, kicks, and direct back fires—are rarer The indirect type of back fire in abduction occurs more commonly than the direct The *mechanisms of the injury* were distributed as follows

	Cases
Fall on the hand	100
Fall of weight	14
Back-fires (indirect)	9
Total	123

After the accident has happened the patients usually notice in the case of *navicular injury or upper carpal syndrome* that it is too painful to bring the thumb into action in any way And a little time after that ' the pain is severe of a dull aching character which makes one feel somewhat sick The pain is to be felt all round the wrist, and it appears to be impossible to find any position to lessen it. Sometimes such a position appears to be found but it becomes intolerable after a while The movements of

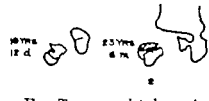


Diagram IX. Two associated naviculo-cuneiform fractures.

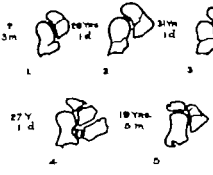


Diagram X. Three naviculo-os magnum associated fractures (1 to 3) a combined naviculo-trapezoid-os magnum fracture (4) and a combined navicular-lunar fracture-compression and lunar and os magnum fracture (5) 2 demonstrates a complete fracture of the os magnum neck as well.

the pollex and the extension of the wrist are the most painful

In the case of the *os magnum retrolunar luxation* or what might be called the *lower carpal syndrome* the main feature of the history is the rigidity and stiffness noted *ab initio* by the patients. The pain may be even more severe than in the case of the upper carpal syndrome and that invariably means involvement—stretching or even rupture—of the median and more rarely the ulnar nerves

In the *late cases*, those seen sometime after the injury, the histories vary somewhat (Marshall) A rather common feature of some of these cases is the complete oblivion of the trauma And then they come up complaining of several degrees of disability painful extension or flexion of the wrist after a certain point, the need of having "to let go in some attitude of the hand performed hurriedly, which in some cases can be avoided whenever the patient's attention is concentrated on the movement, difficulty or inability in grasping objects tools, sporting clubs owing to pain muscular weakness , some more or less marked degree of swelling accompanied or not by pain, more or less marked degree of articular stiffness, nervous dystrophies of the

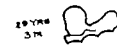


Diagram XI. A transverse associated fracture of the os magnum and trapezoid.

hand, etc In some cases the history is definitely allied to the trauma that produced it.

It will be noticed after reviewing the above cases that the bones entering into the formation of the wrist were involved, as shown in table

	Cases	Single Lesion Cases	Associated Lesions Cases
Radius	8	0	8
Ulna	7	0	7
Scaphoid	106	68	38
Semilunar	20	2	18
Cuneiform	3	0	3
Pisiform	1	0	1
Trapezium	2	0	2
Trapezoid	2	0	2
Os magnum	15	6	9
Uniform	8	4	4
Metacarpals	3	0	3

This shows the scaphoid to be the bone most commonly involved and the pisiform the rarest. The semilunar and os magnum are next in importance after the scaphoid They are both intimately in correlation as will be shown later The proximal scaphoid fragment was very markedly luxated forward in 4 cases, and backward in 3 cases There were 8 cases of combined semilunar-os magnum luxation and two of these cases showed a divergent type of naviculolunar displacement The cases of rotation of the fragments *in situ* are not included among the above named The ulna was luxated backward in one case It is worth mentioning that the dislocations met with in this series never attained the degree described by Couteaud Nicotra, etc *It will be noticed that 35 per* cent of the navicular and 90 per cent of the semilunar lesions were of the associated type Fifty per cent of the semilunar lesions were due to the luxation backward of the os magnum

DIAGNOSIS

The upper carpal syndrome corresponding to the navicular fractures and associated scaphoid pain on abducting



Fig 6 An old associated navicular-ulnar displacement forward, and ulnar styloid fracture Note the marked secondary carpal changes and the calcareous atrophy of the luxated bones This is a case of 6 years duration

the wrist fork like deformity of the wrist if there is a radial lesion with displacement and alteration in the alignment of the styloid line should the radius ulna, or both be involved Ecchymosis is rare in the single scaphoid injury and usually suggests an associated lesion

The lower carpal syndrome corresponding to the os magnum-semilunar associated displacement, is characterized by an increase in the anteroposterior diameter of the wrist palmar swelling below the center of the styloid line depression at the knuckle line of the head of the third metacarpal low type of fork like deformity of the wrist and stiffness of the fingers which are usually held in slight extension

The Vaughan percussion test described by Murphy shows in the early stages of these conditions the maximum of tenderness to be at the third metacarpal head in the lower carpal and at the second metacarpal head in the upper carpal syndrome

Crepitation is very seldom felt in the single injuries and its presence in my experience represent an associated lesion of the wrist

I shall refer very briefly to some points on the morphology physiopathology and radiology of the carpus as the best means of understanding the facts given above and their clinical interpretation

MORPHOLOGY

An examination of the skeletons of certain vertebrata of aquatic habits—crocodiles phoca whales—reveals the ulna to have marked carpal connections and the two carpal ranges to be formed by arthrodia of uneven surface which come in the boundary zone between the proximal and distal carpal series to a straight line

In the heavy mammals—rhinoceros elephant—the ulnar contact with the carpus is very marked the ulna appears to be the dominating forearm bone the radius twists in front of it the deambulation is in pronation and again the carpal bones are regular and evenly distributed The pisiform is in these animals a well formed bone

In the bovidæ and equidæ the ulnar carpal connection is rudimentary the ulna is an elbow structure the carpal anatomy is simple the articulations are of the arthrodial type, and the line between the proximal and distal carpal ranges is linear and the pisiform is a well formed structure

If the smaller monkeys—semnopithecus entellus—are analyzed it will be seen that the pisiform appears like the posterior tuberosity of the os calcis in the foot. At first sight the hand looks like a foot. In the tiger hyena bear dog the pisiform assumes a position and importance as shown in the monkey entellus, for instance

The examination of a higher monkey skeleton troglodytes gorilla demonstrates the ulnar carpal connections to be very faint a marked mesial forearm twist the great size of the scaphoid tuberosity and pisiform ridges of the trapezium and uncus of the uncinate and an already well-established connection between the os magnum head and the proximal carpal range Condylarthrosis appears to be the type of articulation between some of the carpal bones The hand is an organ of progression as well as of prehension The ligaments of these articulations resemble very closely the human

In some of these animals sea lion tiger cat dog etc the scaphoid is fused with the

semilunar, and in some cases other intercarpal fusions or duplications are to be noticed

In man the hand is no longer an organ of locomotion being only a prehensile instrument that is anatomically represented in the carpus by the following features. The os magnum head forms a center of marvelous anatomical contact, it is the pivot of the system There is a reciprocal fitting in of the os magnum head into the proximal, and of the scaphoid foot with the distal carpal range The anatomical fusions are rare i e the scaphoid-centrale The pisiform almost disappears since it is the representative in the carpus of manual deambulation it is the heel of the hand of non aquatic vertebrata and a regressive structure in man All the ridges and tuberosities, so well marked in the troglodytes, are ill developed because man has no longer to climb trees for his existence The ulna-cuneiform contact is very faint and through the triangular ligament which is well developed in monkeys. In fact the ulna is an elbow structure The intercarpal articulations attain the highest degree of mechanical differentiation condylarthrosis an idea of slight enarthrosis and a very marked inter relation between the proximal and distal carpal ranges, leading to delicacy and firmness of motion, is to be seen in the arthrology of the human carpus. These plastic facts are in accordance with the high functional value of the hand of man and with the difficulty in explaining the physiopathology of the wrist and the synergy of the movements performed at the same time by the several anatomical elements of the carpus

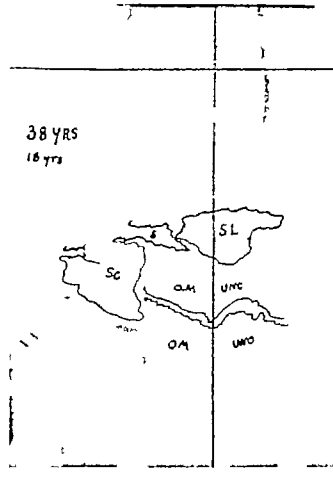


Fig 7 Shows an old (18 years) associated naviculo-lunar displacement forward and os magnum uniform transversal crack Note the double scaphoid radial synostosis and degree of inflammatory fusion of the upper carpal range

PHYSIOPATHOLOGY

The movements of the carpal bones can be followed by reading Diagram XII which represents 3 lateral roentgenograms of the wrist taken in *full extension* (1) *extension* (2) and *full flexion* (3)

In hyperextension 1 the scaphoid is slightly inclined backward and upward, the semilunar articulates with the center of the radial articular surface by its postero-superior surface, the os magnum is inclined upward and its head articulates with the antero-inferior part of the semilunar

In extension 2, the scaphoid assumes a more inclined position backward and upward the semilunar is horizontally placed and the os magnum body has advanced forward

In hyperflexion 3 the scaphoid head is looking backward its foot is almost touching the radial brim, the semilunar follows the scaphoid head and by the middle of its upper surface articulates with the posterior part of the radial surface, the os magnum head now articulates more fully with the semilunar and its body has advanced forward The trapezium and trapezoid follow the navicular foot the uniform the os magnum base and the cuneiform the semilunar In fact, Destot stated that the semilunar and cuneiform act as a meniscus to the radius and distal carpal range

If pressure is now exerted in the palm of the hand, thenar or hypothenar eminences,

acting on the thenar eminence will by pressing on the navicular foot luxate its head backward and produce a fracture of the scaphoid (Auvray Fly Russ Stimson) The navicular fractures due to direct injuries usually occur as the result of circumduction movement produced by the trauma The fracture happens before the scaphoid assumes an anteroposterior direction which is seen at the last stage of wrist hyperflexion (Diagram XII 3) A sudden hyperextension of the wrist due to back fire fall on the palmar surface of the metacarpal heads originates some of these fractures which are better understood by the position of the navicular (Diagram XII 1) vertically placed against the radial surface The types of combined naviculolunar displacement are explained by Diagram XII 1 and 2 The navicular head will be forced backward through pressure on the tuberosity the head of the os magnum being displaced in the same direction The semilunar then slips in an opposite direction forward

Jeanne and Mouchet, Lesser Lilienfeld Murphy) Some of the debated points have been settled by Delbet that the luxation backward of the os magnum brings back all the carpus with the exception of half of the

of the positions above named The integrity of the radiolunar ligaments will prevent a more advanced degree of the lunar luxation as the posterior fascial capsule will avoid a higher backward displacement of the head of the os magnum The incomplete rupture of the anterior radiolunar ligament explains the anterior horn as the semilunar acts as the center of fixation for its dislocations. The os magnum head slips backward under the semilunar facet (Diagram XII 3) and actually presses on the posterior horn of the semilunar when returning to the former position Hence the designation of the semilunar luxation as backward dislocation of the os magnum or retrolunar displacement. The extent of the lateral deviation of the wrist associated with a variable degree of flexion and extension renders the possibilities of the mechanism of these fractures and fracture-dislocations even more complex A systematization of these injuries is described in the work of Jeanne and Mouchet. The varied degrees of semilunar displacement is well brought forward in Murphy's lecture. In none of the cases of the series was I able to find a case similar to Bolton radiolunar lesion

CARPAL RADIOLOGY

The way in which the carpus has been centered has a great bearing on the radiological findings To this effect I have examined a series of plates of the extended wrist centered as follows (a) on the lower third of the forearm (b) on the wrist itself (c) on the metacarpal region

In position *a* the radio-ulnar outline is linear the scaphoid appears lengthened and its foot overlaps part of the three outer bones of the distal carpal range the contiguous surfaces of the semilunar and cuneiform are superimposed the carpometacarpal line appears as if fused and there is distal digression of the pisiform and shadow of the uncus

In position *b* the radio-ulnar outline is double the scaphoid is shorter and less overlapped by the shadows of its neighbors the luno-cuneiform junction is still indistinct the separation between the proximal and distal carpal ranges is more distinct than the carpometacarpal line and there is less downward digression of the pisiform and uncus

In position *c* the radio-ulnar outline is linear the scaphoid appears shortened and the outline of the tuberosity projected on the body may resemble a crack the articular carpal separation is clear the semilunar is slightly superimposed on the radius, and there is a clear view of its posterior horn the carpo-metacarpal line may appear double in places through superimposition of images and give the appearance of fracture and there is proximal digression of the pisiform and shadow of the uncus. It appears therefore that the upper metacarpal exposure brings into view the clearest detail and individualization of the proximal carpal range and the

central or carpal exposure the best view of the distal carpal range The pisiform and the shadow of the uncus are the best points of reference for establishing how the carpal views have been taken These facts are even more clear in stereoscopic roentgenograms which should always be taken It is hardly necessary to insist on the importance of the lateral roentgenogram a careful reading of which gives the exact displacement and degree of comminution of the fragments, which appear in some cases as a bony dust

The control view of the opposite carpus taken in another plate, excludes some congenital conditions which can be unilateral as I have verified Among the commonest are to be mentioned the "epilunatum," 'pretrapezium," "ulnare antebrachii," "os triquetrum secundum" which appear in 1 per cent of cases The navicular is the carpal bone more commonly congenitally divided in 2 pieces (1 per cent) 3 or 4 fragments although Dwight's view that a fractured scaphoid is only a separation of the pieces of a 'naviculare bi or tripartitum," appears to be not the case The degree of communition the variety and levels of the lines of fracture the features of the edges the gap between the fragments and the appearance of the navicular surfaces as shown after removal (Todd) exclude that theory

The anteroposterior image of a displaced semilunar is not only conical as Murphy pointed out but the degree of radial-cuneiform-os magnum uniform superimposition is very marked (Diagram VIII, 1 to 3 and Fig 5) in any of the 3 above mentioned positions of exposure. The shapes of the scaphoid varying from a reniform appearance to a more or less cylindric figure (Gruber) impart to the radiological appearance of the bone some differences of outline.

TREATMENT

The upper carpal lesions usually require rest and the lower ones early movement If the case is seen early any dislocation should be reduced preferably under a general anæsthetic. The wrist should be in the case of scaphoid fracture maintained for 4 weeks as in Figure 12 The plaster is changed twice because it gets loose and to allow for slightly altering the degree of wrist hyperextension The pollex is included since it forms the continuation of the naviculo-trapezium pillar whereby comfort is given to the patient who stops 'feeling pain and only "feeling the wrist.' In old cases forcible wrenching as advised by Sir Robert Jones and in some patients where there is pain or radio-navicular synostosis, resection of the scaphoid sometimes relieves the pain and improves the degree of mobility of the wrist The wrist is maintained for sometime in a well fitting leather brace let which appears to avoid the development or the aggravation of secondary tenosynovitis The tenosynovitis when present is improved sometimes, by means of thermotherapy, heliotherapy and electrotherapy Early movements should be advised after the reduction of the os magnum retrolunar luxation

If the fragments cannot be replaced they should be removed A palmar incision is preferable for the semilunar and a lateral one for the scaphoid Early movements should be advised Figure 3 shows a case of semilunar and proximal scaphoid excision 4 months after the trauma The result was fair Figure 4 shows a case seen 33 months after an identical operation performed 3 months after the injury The movements were painful and there was marked swelling at the wrist. An identical operation performed much later (Fig 6) slightly improved motion and pain All these facts favor an early reduction or removal of the non reducible fragments.

The mobilization' of the wrist was performed in one case (Figs. 8 to 11) Fascia lata as advised by Putti was used The hand was kept in the intervals of the massage and movements of fingers and wrist, in an extension to a Thomas splint for one month and in a cock up splint for another month. The works of the pioneers in this field are well-condensed in Serra's monograph The future of these operations is great and the results obtained fully justify their repetition

PROGNOSIS

Thirty per cent of the cases of the series had met with the carpal injury 4 months to 18 years previously Diagram III and Figures

fully with border line cases than with the more hopeless ones Having gone so far we as radiologists feel that if we can produce proof of just as successful results as surgery in what have been generally recognized as operable cases in the past, it is our right to treat such cases also Naturally we shall aim to produce better results than surgery whenever possible but above all, the best interests of the patients are always to be uppermost in our minds Cooperation between the surgeon and radiologist is frequently of paramount importance. Radiology may be employed as an ante-operative procedure in conjunction with surgery or as a postoperative measure It is a well recognized fact that radiation cannot do well in what surgery has tried to do and failed The recurrent case after operation does not respond as well as the primary case because we have to deal with anatomical, physical and biological factors that are quite different

There are three recognized agencies for dealing with cancer at the present time preventive measures, surgical procedures and non surgical methods. Preventive measures are more widely applicable about the mouth than any other locality Proper attention to the teeth can unquestionably prevent many cases of cancer or precancerous conditions The regulation of the use of tobacco may help in cases showing a tendency to leucoplakia When syphilis seems to be a possible factor antisyphilitic treatment should be pushed energetically but too much valuable time should not be expended solely on such a measure when the lesion does not appear to respond Leucoplakia should always be carefully watched and treated if necessary and cracks and fissures on the lips should not be allowed to persist

It is not our purpose to discuss surgical measures except from the standpoint of cooperation with non-surgical methods The non-surgical methods which are now generally recognized as applicable in the treatment of lip and mouth cancer and its metastases are the use of radium the X rays and electrothermic coagulation or possibly the actual cautery In many instances all of these agents must be combined and frequently with surgery In comparatively few instances is any one of them employed alone

Cancers involving the regions designated may be roughly grouped into lesions involving the lower lip and corner of the mouth the tongue, primary lesions in the floor of the mouth the tonsil, and in the mucous membrane covering the cheeks, the alveolar processes the palate and pillars. The disease in each of these anatomical structures requires separate consideration Mainly for obvious anatomic reasons the upper lip is not included except when the disease involves the portion near the corner of the mouth From the standpoint of a radiologist the essential purpose of this paper must of necessity be the presentation of the present status of non-surgical methods of treatment

THE LOWER LIP

The radiologist is probably not so much concerned as he should be in distinguishing between epidermoid and basal cell cancer of the lip He realizes what the worst outcome may be and treats all cases with that idea in mind He sees too often the results of direct surgical trauma to cancerous tissue and is loath to satisfy his curiosity by pathological proof of the cellular characteristics of a lesion unless certain that the removal of a specimen is absolutely safe

Theoretically lip cancer should be readily cured by surgery because both the primary and metastatic lesions are easily accessible but this is not the result practically mainly because surgery does not always remove all the cancer and a large number of cases are not seen sufficiently early Surgical results would be ideal if some means of education could inculcate in the mind of every individual that every ulcer fissure or keratosis of the lip persisting for several weeks especially if showing induration and if syphilis be excluded is either cancerous or potentially cancerous and that such an area should be removed The vast majority of lip cancers

groups from the standpoint of methods of

treatment, prognosis and statistics as follows primary lesions without any evidence of metastasis, cases presenting small palpable *nodes in the submental or submaxillary* triangles, and those with advanced primary lesion and large nodes in these areas or in other gland groups The greatest danger from cancer of the lower lip is metastasis, which, if it has occurred, increases the death rate very considerably In view of the frequency of metastasis every one who treats such cases by any method should have an intimate knowledge of the lymphatic drainage from the lip Lymph vessels pass directly downward from the central portion to the glands in the submental triangle, and from the lateral portions to glands in the submaxillary triangles The submaxillary salivary glands are well surrounded by lymphatics If there is blockage in the lymphatics of one side from cancer or some inflammatory process, the free anastomosis with the opposite side readily permits metastasis to pass from one side to the other After involvement of these groups of lymphatics, metastasis may proceed to others in the neck

In the first group of cases, without palpable nodes in the neck the results of surgery are good Metastasis without palpable evidence is likely to be present in a certain percentage of these cases, however, and surgery alone cannot be complete without including the removal of all glands in the submental and submaxillary triangles Broders[1] in 1920 presented statistics on 449 cases operated upon at the Mayo Clinic and in which lymph nodes were removed, and metastasis was found in 23 38 per cent At best, the results of surgery are little more than 90 per cent of cures after 5 years Sistrunk[2] in a recent communication presented statistics of cases of cancer of the lower lip operated upon at the Mayo Clinic during 1912 1913, 1914. Of 93 complete cases in which the primary lesion was excised and glands in the triangles removed and found not involved 90 3 per cent were living 5 to 8 years after operation In eleven of these local recurrences were subsequently removed and there were three recurrences in neck glands

The striking feature in these and many other statistics is the frequency of local recurrence, which indicates an incomplete removal of the primary lesion leaving *in situ* cancer cells which have ample time to cause metastasis while the recurrence is developing to discoverable proportions Obviously the results should be better and surgery alone cannot be regarded as a complete method of treatment in view of our present knowledge of the effects of radiation Many surgeons are satisfied to employ it as a postoperative measure The wisdom of this is not borne out either by results or by scientific knowledge of the effects of radiation It is our firm belief that every case should have at least a preliminary application of radiation before any attempt at removal of the primary lesion or lymph glands is attempted We have not advocated non surgical measures alone until a technique was developed which we believed was safe and certain of results Too few cases have passed the five year period to make our statistics of value, but we are well satisfied so far with the results we have obtained

Our technique comprises a preliminary radiation of the area of the primary lesion and well beyond all apparent evidences of involvement by radium Cross firing is practiced as far as is possible and we aim to produce a severe reaction At the same time the region of lymphatic drainage is well radiated by radium across the face from the level of the posterior aspect of one submaxillary salivary gland to the same point on the opposite side. A full dose of X rays is then given over each side of the neck, and as the submental and submaxillary triangles are not apt to receive their full share of the dosage because of the protection of the mandible these areas are given an additional dose of radium This additional dose of radium produces a severe but not dangerous reaction If the case is being thus prepared for the surgeon we advocate waiting for the reaction to have reached its

[1] Broders. Squamous-cell epithelioma of the lip. J Am M Ass 1920 lxxv 656

[2] Sistrunk, W E The results of surgical treatment of epithelioma of the lip Ann Surg 1921 May lxxiii 561

maximum and to subside slightly before operation in order that the maximum effect upon the lymphatic channels as well as cancer cells may be brought about If the case does not come from the surgeon we proceed immediately to destroy the primary lesion by electrothermic coagulation for two reasons to obtain the added advantage of heat and to relieve the patient of the discomfort resulting from the severe radiation of the primary lesion When a large mass of tissue is thus removed there is some danger from secondary hemorrhage when the slough separates and the patient is instructed how to stop the bleeding by pressure Patients suffer little or no pain and there is only the annoyance from the sloughing process Healing is complete in 2 weeks to a month Usually there is insufficient deformity to require subsequent plastic surgery As this procedure does not entail possible surgical trauma to cancerous tissue we do not fear the possibility of metastasis appearing later The radiation of the neck is repeated once or twice at subsequent periods.

In dealing with cases belonging to the second group we have practically discontinued giving postoperative radiation unless it is employed as an anteoperative measure as well as the results do not warrant its use Cancer tissue once directly traumatized by surgery without a complete removal and without previous radiation does not respond well to any form of treatment and all too frequently upon the radiologist is laid the blame for inefficacy of radiation If we are expected to treat cases at all, we should surely be accorded the privilege of directing that treatment along such lines as our experience shows to be the most effectual. The technique we now employ in cases belonging to the second group deals with the primary lesion lymph-channel areas and glandular regions in exactly the same way as in the first group with destruction of the primary lesion by electrothermic coagulation If the enlarged glands do not subside or do not diminish with reasonable rapidity we may either try radium implantation or refer the case for block dissection, in which case we may regard the treatment already given as an anteoperative procedure If the case is referred to us by a surgeon the anteoperative treatment is given in the same manner as for group one cases and the case is then referred back for excision and block dissection as soon as the reaction has subsided somewhat. It is then referred to us subsequently for postoperative treatment

In this connection we are quite in accord with the procedure advocated by Quick[1] of embedding emanation tubes in the operative wound at all suspicious areas and especially where lymph channels have been cut or cancer tissue has inadvertantly or of necessity been cut into and not removed in entirety The resulting slow radiation and intense local but not far reaching reaction from β radiation must certainly be efficacious and entails no danger to the flap if the emanation seeds are well covered One must use care in giving postoperative radiation following this procedure. We have not had the opportunity of following this technique because of the lack of an emanation plant at our disposal The frequently flaunted objection of anteoperative radiation making the operation more difficult seems to be without good foundation according to the statements of those who employ both radiation and surgery especially if the operation is not performed at the time of the reaction

We do not wish to go on record for the origin of a broad statement to the effect that cases of cancer of the lower lip without metastasis or with early metastasis can be handled satisfactorily by non-surgical methods for the reason that such a broad statement is subject to too much latitude in its interpretation We do believe however that such cases can be handled in a perfectly satisfactory manner by non-surgical methods alone or in conjunction with surgery but we absolutely insist that the technique carried out must be one similar to the one we have advocated and that each procedure must be rigidly carried out to the most minute detail.

Cases belonging to the third group with advanced primary lesion and extensive gland

1. Quick, Douglas The conservative treatment of cervical lymphatics in intra-oral carcinoma. J Am M Ass 1911, Aug 6

ular metastases comprise an unfortunate class of mortals whom no one cares to handle They usually fall to the lot of the radiologist to treat The choice between surgeon and radiologist is practically one between two evils Surgery cannot help, and usually makes matters worse Radiation usually can do no better but is preferable. Implantation of radium into glandular metastases that have usually in filtrated through gland capsules is practically an imperative part of the procedure of radiation

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RADIUM TREATMENT OF MYOMA OF THE UTERUS AND MYOPATHIC BLEEDING

Final Results in One Hundred Eighty Three Cases[1]

By C. Jeff Miller, M.D F.A.C.S New Orleans

No abdominal operation has reached a higher degree of technical perfection or given more satisfactory postoperative results than hysterectomy as usually performed for myoma of the uterus It is generally conceded that the results, both primary and secondary hardly permit of improvement. For these reasons it is difficult to convince the surgeon that any other method of dealing with myoma of the uterus and and hæmorrhage of myopathic origin can compete with the already standardized surgical procedures Any other method of treatment must present properties rarely possessed by a therapeutic agent, and the results obtained by such a remedial agent must show that the relief is permanent, and that its use is safer than operation and gives a higher percentage of preservation of physiological function than an operation performed by a skillful surgeon

That we possess in radium such a therapeutic agent and that it will eventually supplant surgery in a large percentage of cases now treated by hysterectomy I propose to prove by submitting the final results obtained in 183 cases treated with radium and observed over a period of 7 years Between May 1914, and July 1921, 230 cases were treated by radiation, but satisfactory follow-up records are available in only 183 cases. It is useless to dwell upon the effects of radium or the primary clinical results since these phases of the subject are already definitely established, and about them there is little doubt These records are of value chiefly because of the time that has elapsed since the treatment was instituted

Since it may be inferred that I am over enthusiastic in regard to the use of radium I would make this point clear in the beginning by stating that during the same period of time which this report covers nearly an equal number of cases have been treated surgically Thus it can be clearly shown that I appreciate the limitations of radiation and am by no means insistent that it can supplant surgery in all cases of myoma of the uterus or essential hæmorrhage. The age of the patient the type and social situation as well as the size of the tumor the condition of the appendages the evidence of previous infection, and the general condition of the patient are all factors to be carefully weighed in determining the most satisfactory method of treatment

Surgery is unquestionably the procedure of choice in young women who present definite growths causing excessive bleeding, submucous growths or cases in which suspicion exists of malignancy of the fundus of the uterus In these types of cases conservative surgery is decidedly less radical, this is a point that cannot be too strongly emphasized In order to induce shrinkage or disappearance of a myoma it is necessary to produce at least a temporary cessation of menstruation and the dosage of radiation has not yet been so

[1] Read at Southern Surgical Association, Pinehurst, North Carolina, December 1921

controlled that a temporary suppression can be foretold with the degree of accuracy necessary for justifying its use when conservation of function is of primary importance Therefore in young women, when definite single tumors are present the patient should be persuaded that operation offers a chance for myomectomy with preservation of the physiological functions In small multiple growths when it can be definitely established beforehand that hysterectomy is necessary radium should be adopted as the method of choice.

The most striking feature revealed in a review of both series of cases, those treated by radium and those treated by surgical intervention is the increasing percentage of myomectomies performed where formerly hysterectomy would have been done The prevalent idea that myomectomy is attended with a high mortality and that second operations are necessary in too large a percentage of cases to warrant conservatism is not borne out by the results obtained by competent surgeon The decision to resort to myomectomy in many cases which would have been subject for hysterectomy formerly was prompted by the assurance that if myomectomy failed to control the hemorrhage or check the menstrual disorders radium would complete the cure without further surgical interference With such assurance, the scope of conservative surgery has been materially widened a larger number permanently relieved and the percentage of subsequent pregnancies has further justified the decision

Large myomata should be treated by myomectomy or hysterectomy Unless some contra indication to operation exists, there is no valid reason for the use of radium in large tumors Massive growths too often present serious complications such as adhesions, salpingitis degenerative changes and pressure symptoms to prompt the surgeon to depend upon radiation as the method of election

Radiation has, however a distinctive application in this group in that it will promptly control the hemorrhage until such time as the consequent improvement in the patient s general condition will render her a safe operative risk. Radium is a valuable adjunct to surgery in this group but it should seldom be the elective treatment in myomata larger than a three and a half months pregnant uterus. Upon this point the majority of observers generally agree large growths only partially shrink and the period of treatment extends over too long a time to satisfy either the physician or the patient Therefore in cases of this group radium should be used only in exceptional instances.

One hundred and seven of the 183 cases of this series presented myomata varying in size from small tumors detected during the

few of the latter group treated and practically all of them presented contra indications to operation The ideal type for treatment with radium is the small or moderate sized interstitial myoma The primary result is uniformly prompt and recession in the size of the growth while variable, is sure The diminution is usually more than 50 per cent The growth is frequently reduced to a negligible affair and often entirely disappears

Submucous growths while responsive to radiation should be selected with extreme care, owing to their known tendency to infection and sloughing after intra uterine manipulations. In our series two of the earlier cases of this type developed pyometra and one of them eventually required a hysterectomy The size of subperitoneal growths is influenced least of all and it has also been noted that radium has less effect in reducing the size of myomata in women beyond the menopause Our best results appear to have been obtained in women presenting a history of severe menorrhagia

It is apropos to mention here the technique followed in the application of the radium Preliminary curettage should precede the application in order to permit a careful bimanual examination under anæsthesia, to eliminate small polypi, and to provide for a microscopic examination of the uterine scrapings

The radium is introduced into the cavity of the uterus screened by brass and rubber or frequently a celluloid capsule, and is left *in*

situ from 3 to 24 hours, according to the indications The average time of exposure in our series in young women—those under 38 years of age—was 12 hours in cases of myomata. In women beyond this age, where it was not so important to preserve menstruation the treatment lasted 24 hours As a rule, 50 milligrams of the radium element was employed This dosage produced permanent cessation of menstruation in women over 40 years of age in 94 per cent of the cases In our earlier work a second exposure was made within 10 days or 2 weeks, but it was soon observed that this was unnecessary, and often caused discomfort that was persistent, and occasionally very distressing

At present we believe that one application is sufficient, and that subsequent exposures should be given only as indications develop The recession in the size of the growth may be surprisingly rapid, or it may be gradual Again, the growth may appear unaffected for several months and then suddenly show a rapid shrinkage For this reason repeated exposures should be cautiously advised, and repeated examinations should be made to check the status of the tumor Lately we have preferred to make 15 hour exposures, and to repeat the application in 3 or 4 months if it is necessary We have found that, even after reducing the exposure, the single application is usually sufficient. This permits of its use in younger women, since our experience has shown that in many cases menstruation will reappear in several months, or as late as 2 years, and continue normal thereafter Furthermore the menopausal symptoms are apparently less marked when the shorter exposures are employed

One hundred and two of the 107 cases reported complete relief from hæmorrhage with in 5 months after radiation Two of the remaining five required a second application before being relieved Two others were not relieved by a second exposure, and the remaining case was eventually subjected to hysterectomy in another clinic These figures practically correspond with the results obtained by other observers, and prove conclusively that no other agent at our disposal equals radium in controlling excessive uterine bleeding

It has already been mentioned that the effect on the size of the tumor is variable Fifty seven cases returned within 5 years for other conditions or for examination In 37 of these the growth could not be determined at the subsequent examination or was so reduced as to be classed as negligible. In two instances massive growths as large as a 7 months' pregnant uterus, had shrunk below the umbilicus Radium had been used in order to control bleeding because these patients were temporarily bad surgical risks Both were sufficiently improved by the treatment to permit of successful operation at a later date. Reports were obtained from the balance of the series either directly from the family physician or from the patients who reported the findings of their medical attendants and these records practically correspond with those in the cases under my personal observation

In outlining the limitations of radium, too much stress cannot be placed upon eliminating chronic pelvic infection Latent infection is so prone to be fanned into activity by radiation that no case is selected for this treatment when doubt exists as to its presence In four cases in this series all of which occurred in our earlier work, this truth was not appreciated In two cases pelvic suppuration followed, requiring vaginal drainage one required a hysterectomy after a prolonged siege of pelvic peritonitis and the fourth case was an invalid over a period of several months

It was further noted that patients who complained of pain associated with myomata were not usually relieved of that symptom even when bleeding was controlled, and the tumor partially reduced by radiation This symptom is frequently attributed to pressure, but certainly pressure cannot always be the cause, else the pain would disappear as shrinkage occurs This has happened so often that now we usually advise the patient that the bleeding will cease the tumor may shrink but that we cannot promise that the pain will be relieved

Seventy six of the 183 cases were instances of myopathic hæmorrhage such as are commonly classified as chronic metritis, hyperplasia

fibroids, uterine insufficiency and so forth conditions most frequent in women approaching the menopause In this type radium more nearly approaches the ideal specific than any therapeutic agent at our command Formerly hysterectomy was the only satisfactory method of dealing with these conditions At present it may be stated without exception that the surgeon who advises hysterectomy in uncomplicated cases of this group when radium is available is hardly acting in the best interests of his patient

Fifty-eight cases of this last group were between the ages of 38 and 54 years More than half had been subjected to all the measures usually employed except hysterectomy All received practically the same dosage viz a 24 hour exposure from a tube containing 50 milligrams of the radium element as all of them had arrived at the age when it was not essential to preserve the physiological function Four of them required a second application within 2 years for recurrent hæmorrhage and were eventually cured

Eighteen cases were between 15 and 36 years of age 5 of them being between 15 and 18 The five instances of severe hæmorrhage in the women between 15 and 18 are of special interest All had been treated by rest tonics glandular extracts and repeated curettage without relief and the hæmorrhage was so severe in one case that preparations had been made for transfusion Three to 8 hour exposures with 25 milligrams of the radium element produced a temporary amenorrhœa and menstruation was re-established in all cases within 14 months In four cases it was perfectly normal Since we do not know the ultimate effect of radium on the ovarian structures it should be used only as a last resort in women of this age In the cases reported it was used only *after every other* measure had failed to give relief and the final results were a signal triumph for radiation

Of 18 cases under 35 in which it was desirous of controlling bleeding without producing permanent cessation of menstruation radium was applied from 8 to 12 hours until from 200 to 800 milligram-hour exposures were given Six ceased to menstruate promptly 4 of these reported a return in 1 year which in one case was quite profuse in the other cases it was perfectly normal Five cases continued to menstruate scantily the flow lasting the normal duration of previous periods. In four instances the flow was reduced and remained regular Three cases menstruated irregularly reporting scanty periods every 2 or 3 months

Three pregnancies were reported in the series One woman was delivered of a premature healthy baby at 8 months The second case aborted at the fourth month The third case is now 8 months advanced in pregnancy An interesting feature of the cases of pregnancy is that in two instances there had been a period of sterility preceding the treatment in one case of 3 years in the other of 8

When it was desirous of controlling bleeding in women over 40 years of age and full dosage was used Immediate cessation of menstruation followed in 20 per cent of the cases Sixty per cent menstruated once 15 per cent menstruated irregularly and the balance reported no relief and have since returned for a second treatment The second treatment was successful in all but three instances and two of these three were relieved by a third exposure

Profuse leucorrhœa was noted in about 20 per cent of the cases and a slight but persistent discharge was reported in 30 per cent In about 40 per cent it was absent or was so slight as to cause no comment. Not infrequently radium cured or markedly diminished a leucorrhœa which was present before its application The leucorrhœa as a rule rarely lasted longer than 6 or 8 weeks but in several instances it was persistent after a year

A few of the patients were operated upon subsequent to radiation Four of them had *radium preliminary to operation in order to* improve their status as surgical risks Two developed pyosalpinx and both required hysterectomy Two continued to complain of pain and submitted to operation for relief Two others became discouraged and submitted to operation before sufficient time had elapsed to test the effects of radium

Subsequent reports as to the menopausal symptoms are interesting In women over

40 in whom preservation of function was not considered important, about 60 per cent reported flushes and the usual phenomena of the climacterium In about 20 per cent the symptoms were reported as severe, and almost invariably these cases had given a history of bleeding of the aggravated type The duration of symptoms lasted about the time of the normal menopause, but in two cases the flushes were very severe and have persisted for 6 years The patients in their latest reports state that the flushes are as frequent and as severe as they were during the first 4 months following radiation

This brief review of cases extending over a period of 7 years reasonably warrants the conclusion that a large percentage of the cases of myoma of the uterus formerly subjected to operation can be permanently and safely relieved by radium and that practically all cases of uncomplicated essential hæmorrhage can be cured by radium

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CRANIAL NERVE PALSIES PRODUCED BY TUMORS IN THE REGION OF THE JUGULAR FORAMEN

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THREE cases of unilateral paralysis of the larynx with involvement of the last four cranial nerves of the same side were selected to report because the paralysis in all of them was due to extracranial tumors In two cases the paralysis was due to tumors arising from the deep portion of the parotid gland in the retromandibular fossa, and in one case to a lesion in the region of the jugular foramen the exact nature of which is not known A tumor was removed by operation in one case only (Case 285410)

Case 1 (285410) Mr A. W age 35 came to the Mayo Clinic August 21 1919 because of deafness in the right ear On examination polyps in the right ear and a small mass below the ear were found. The polyps were removed and radium was applied to the mass

The patient returned to the Clinic October, 1920 He was still deaf and often during 15 months had had dull pain below the right ear For 8 months he had had headaches in the right temporal region extending down below the ear, and paræsthesia of the right side of the tongue. For one year he had been unable to swallow dry food He had been hoarse for 10 weeks.

Examination revealed the right cord to be fixed and a collection of mucus in the right pyriform fossa. On further examination the right pupil was found to be somewhat smaller than the left and the reflexes and fundi negative There was almost complete motor paralysis of the right half of the soft palate the right vocal cord was paralyzed and the voice hoarse and nasal There was moderate paresis of the right sternomastoid muscle atrophy and fibrillary tremor of the right trapezius muscle and fibrillary twitchings and slight atrophy and paralysis of the right half of the tongue A diagnosis was made of paralysis of the ninth tenth eleventh and twelfth cranial nerves with partial paralysis of the sympathetic nerve due to a tumor in the retromandibular space.

November 13 1920 operation was performed (Adson) The tumor was removed by the technique described herein. The patient recovered uneventfully except for slight weakness of the right facial nerve which was injured during the operation In a report 10 months after operation the patient stated that his voice and the ability to swallow had improved somewhat but the right half of his tongue was still paralyzed.

Case 2 (348444) Mrs. N B age 42 came to the Clinic February 3 1921 She had had ulcer of the stomach 15 years before a gastro-enterostomy had been performed in 1915 with partial relief of symptoms. She had had migraine with attacks of vomiting and vertigo for about 28 years. For the last 8 years she had been partially unconscious during attacks probably migraine syndrome. For the last 6 years she had had attacks of choking and coughing these had been much worse the last 2 years occasionally while talking she had a catching sensation in her throat Her voice was husky and at times lost. The right side of her tongue had felt thick and stiff for about 18 months.

Examination revealed slight enlargement of the heart to the left with systolic murmur transmitted

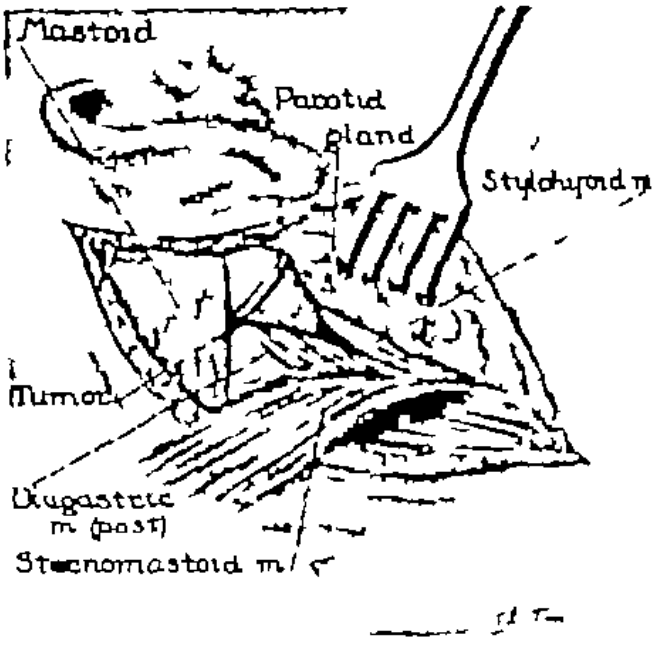


Fig 1 Tumor after the sternomastoid had been reflected and before the mastoid process, stylohyoid, and posterior belly of the digastric had been reflected

to the axilla Examination of the ear was negative Examination of the blood revealed secondary anemia the hemoglobin was 30 per cent the erythrocytes were 3 170,000 the leucocytes 5,800 the differential count was normal The Wassermann reactions on the blood and the spinal fluid were negative Roentgenograms of the chest revealed thickened pleura at the right base Between the angle of the right jaw and the mastoid process was a hard fixed mass The pharyngeal wall bulged slightly inward posterior to the tonsil on the right The patient coughed on pressure on the external tumor Further examination revealed ptosis of the right eyelid, the right pupil smaller than the left diminished reflex to touch on the right soft palate, partial motor paralysis of the soft palate and pharyngeal muscles and paralysis and marked atrophy of the right side of the tongue Speech was slurred and dysarthric The right vocal cord was completely fixed There was marked anesthesia over the right half of the soft palate right pharynx, and larynx Practically all deep reflexes were increased

A diagnosis was made of tumor in the region of the jugular foramen and paralysis involving the ninth, tenth twelfth and probably the eleventh nerves On account of the anemia and the poor condition of the patient radium treatments were given The patient in a report seven months after her visit to the Clinic states that she is somewhat improved but that the tumor is still present

Case 3 (361633) Mrs G L age 40 registered at the Clinic June 15 1921 Seven years before, following the birth of her last child she noticed slight difficulty in swallowing; this gradually increased and then improved Six years before she had had occasional occipital headaches. Four before her tongue had begun to feel thick and troubled her in speaking All of her teeth had been removed recently

The general physical examination the Wassermann reaction on the blood and the roentgenograms of the cervical spine were negative Further examination revealed the pupils, the fundi and hearing to be normal The right soft palate was atrophied and paralyzed the pharynx on the right side was anesthetic The right sternomastoid and the trapezius muscles were atrophied, the right side of the tongue was atrophied and paralyzed and the serratus magnus and suprascapular and infrascapular muscles on the right side were atrophied and partially paralyzed There was a questionable mass in the region below the ear posterior to the ascending ramus of the jaw

A diagnosis was made of incomplete paralysis of the ninth tenth eleventh and twelfth nerves on the right side and partial atrophy of the supraspinati and infraspinati on the right side and a lesion in the region of the right jugular foramen. Because of the length of time symptoms had been present, and the questionable tumor it was thought inadvisable to explore at this time and radium was applied over the region of the tumor The patient was dismissed to be observed by her home physician A report from her October 1 stated that there was no change in her condition

The recognition of unilateral associated laryngeal paralysis dates from Jackson's first description in 1864 and since then the condition associated with paralysis of the soft palate and tongue on the same side has been described as Jackson's syndrome In 1891 Avellis described a group of cases presenting the syndrome of palatolaryngeal hemiplegia. In 1897 Schmidt described still another combination of paralyses associated with laryngeal hemiplegia Vernet recently called attention to a combination of unilateral paralysis of the three nerves passing through the posterior lacerated foramen. Collet reported unilateral extracranial paralysis of the last four cranial nerves resulting from injuries Numerous combinations of unilateral paralysis of the larynx associated with paralysis of one or more of the last four cranial nerves, may be encountered Some of these have become classic

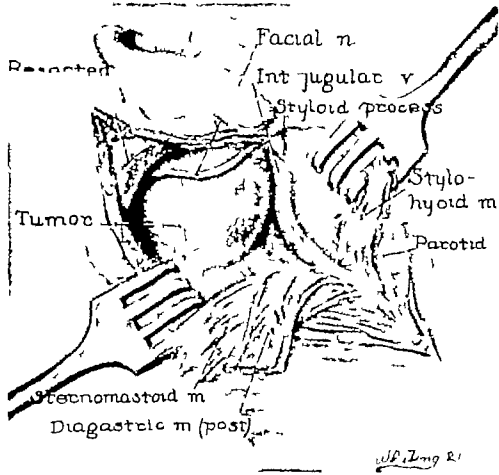


Fig. 2 The tumor after part of the mastoid process petrous portion of the temporal bone below the auditory canal have been rongueted away and the stylohyoid and posterior belly of the diagastric muscles reflected.

CLASSIC SYNDROMES

	Hemiplegia of larynx	Hemiplegia of soft palat	Hemiplegia of tongue	Hemiplegia of sternomastoid and trapezius
Syndrome of Avellis	+	+	−	−
Syndrome of Schmidt	+	+	−	+
Syndrome of Jackson	+	+	+	−
Syndrome of Tapia (Total syndrome (Collet) of last four cranial nerves	+	−	+	−
	+	+	+	+

In Case 1 the last four cranial nerves were involved Case 2 was similar to Case 1, but the external branch of the spinal accessory nerve was apparently not involved In Case 3 the last four cranial nerves on the right side were paralyzed, and there was slight atrophy and weakness of the serratus magnus and supraspinatus and infraspinatus muscles on the right side

It is often difficult to make a diagnosis and at times it is impossible to differentiate the extracranial lesions of the last four cranial nerves from bulbar or intracranial lesions but usually in cases of intracranial lesions other symptoms referable to involvement of part of the cerebrospinal nervous system, such as hemianæsthesia hemiparesis and hemiataxia are present

The exact nature of the lesion in many cases reported under Avellis, Schmidt s, and Jackson s syndromes is doubtful since in many instances the diagnosis was not verified by operation or necropsy Some of the verified extracranial lesions which produced unilateral associated laryngeal paralysis were due to aneurisms in the region of the jugular foramen causing paralysis of the last four cranial nerves One case was probably the result of tuberculous glands in the retromandibular fossa producing the syndrome of the posterior lacerated foramen Many cases were due to trauma stab wounds, and

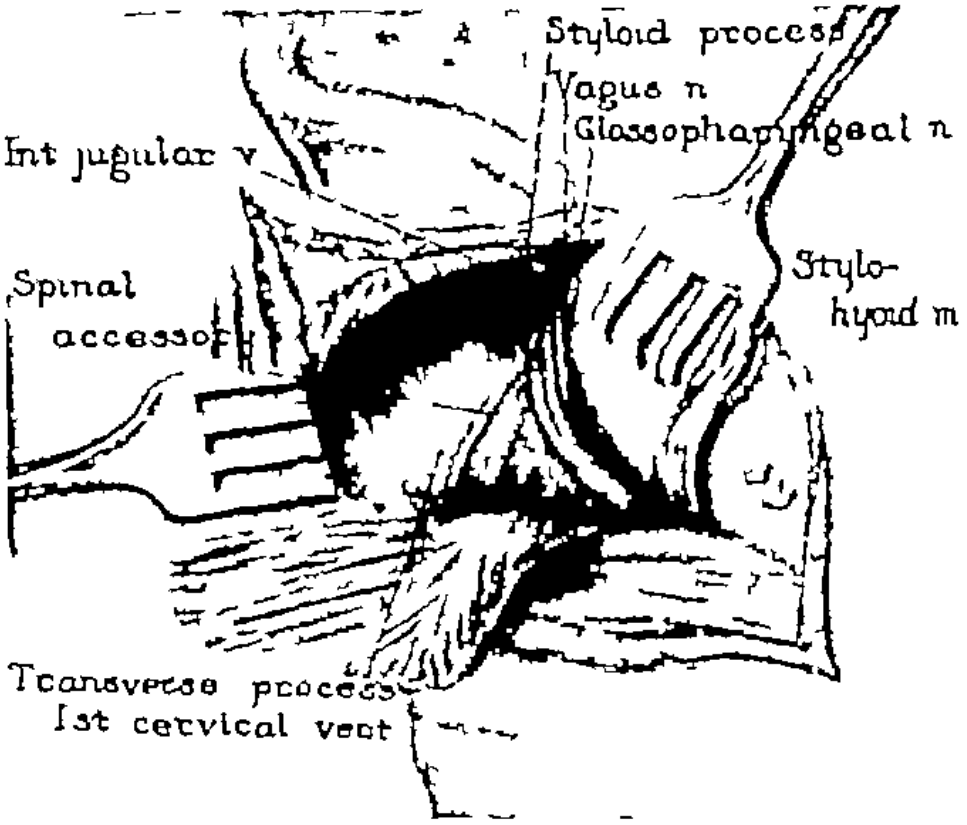


Fig 3 The bed of the tumor with the nerves and jugular vein on which pressure had been made by the tumor

gunshot wounds in the region of the base of the skull while others were due to inflammations nasopharyngeal neoplasms and syphilitic extracranial lesions I was unable to find a report of such cranial nerve palsies caused by tumors of the parotid

TECHNIQUE OF OPERATION

The method of exposing the region of the jugular foramen in Case 1 was as follows An incision was made along the anterior border of the sternomastoid muscle extending well up along the anterior border of the mastoid process By retracting the anterior border of the sternomastoid backward and by dissecting forward a well-encapsulated tumor was exposed posterior and medial to the ascending ramus of the jaw and anterior and medial to the mastoid process below the lower bony wall of the external auditory canal and medial to the stylohyoid and posterior belly of the digastric muscles (Fig 1) The mastoid process was rongeured away together with part of the temporal bone below the auditory canal The bellies of the stylohyoid muscle and of the digastric muscle were divided and reflected in order to obtain exposure (Fig 2) Posteriorly the tumor was in contact with the transverse process of the atlas it arose apparently from the deep portion of the parotid gland The ascending ramus of the jaw anteriorly and laterally and the mastoid process posteriorly prevented the tumor from bulging outward in its growth, and as a result it pressed against the structures that pass through the jugular foramen (Fig 3) The tumor was removed by careful dissection with the capsule intact, except a small projection which extended up through the jugular foramen along the jugular vein This part was curetted away and the entire cavity packed with gauze saturated in Harrington s solution Pathological examination of the tumor revealed mixed tumor of the parotid

SUMMARY

In the three cases described cranial nerve palsies resulted from tumors in the region of the jugular foramen. In two of the cases the

tumor arose from the deep portion of the parotid gland and in enlarging extended to the region of the jugular foramen Attention is directed to the fact that extracranial tumors or other lesions in the region of the jugular foramen are accessible and may be removed surgically If the tumors are of the mixed parotid type they are encapsulated in the early stages, and during this stage surgical removal is the best method of treatment

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CONGENITAL MEGACOLON IN ADULT

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THE occurrence of the so-called idiopathic dilatation of the colon in childhood is not exceedingly rare but a well authenticated case of congenital megacolon in the adult is sufficiently unusual to merit description

Mr A. F age 26, had been obstinately constipated since birth. Enemata became gradually less effectual Recently the bowel has been emptied by a physician at intervals of 3 or 4 months, when severe abdominal cramps demanded relief A general feeling of "heaviness and a tired feeling in the legs preceded the cramps. Twice he has been compelled to have his rectum unpacked in a hospital the absence of subjective symptoms was remarkable the family history as regards similar trouble

Inspection revealed prominence of the entire left half of the abdomen here the percussion note was dull elsewhere it was tympanitic although the abdominal walls were flaccid A rounded, solid painless mass could be palpated in the left upper quadrant Physical examination was otherwise negative.

The X ray examination by one of us (Davidson) revealed chest and œsophagus normal. Stomach apparently hypertonic in type and appears turned upon itself in such a manner that the lower border is represented by the concave lesser curvature, and the upper border by the convex greater curvature There is nothing to indicate any irregularity in outline of either the lesser or greater curvature Pylorus normal location its outline is not distinctly observed. Duodenum normal.

Four hour examination shows no gastric retention. Twenty four hour examination shows all the

outlined
Forty-eight hour
the position of the
solution were allowe
outline of normal colon is not observed The clysma solution drops into what appears to be a bag which seems to fill the entire abdominal cavity This pouch or bag appears regular in outline except at one point on either side where there appears a slight indentation This pouch seems to have no connection with the ascending colon since none of

the clysma solution seems to enter the ascending colon directly from the pouch The ascending colon retains the same outline that was observed during the previous examination.

The rectum, which seems to be only about one-half the normal length is directly continuous with this large pouch.

Operation August 6 1921 Through a left rectus incision, an enormously distended loop of bowel was delivered with some difficulty from beneath the

ascending colon At the lowest accessible point where section was made, the rectum approximated 7 inches in its flattened diameter Two clamps above and two below were required for occlusion Division was made with the Percy cautery The diameter of the rectum and the thickness of its walls complicated closure The withdrawal of the two clamps during traction upon the inverting suture proved an awkward procedure and slight leakage occurred The proximal section was made through the normal descending colon A colostomy was placed slightly below the level of the umbilicus in the upper third of the incision (Re-establishment of the intestinal continuity will be undertaken later)

was dull white in color and of the consistency of leather weight 3900 grams circumference 47 5 centimeters in middle length of enlarged portion 40 centimeters, entire specimen 60 centimeters circumference at lower cut end, 36 centimeters (entire dilated portion could not be removed) capacity after fixation 2250 cubic centimeters estimation of original capacity 2880 cubic centimeters The wall was thickened rugæ of mucosa very large vascular supply abundant mesosigmoid greatly thickened neither pigmentation, so generally observed nor ulceration of the mucosa were present (No proper conception of the size or capacity of the dilated colon can be formed from the laboratory measurements of the excised segment)

Microscopical examination Submucosa very loose and thick vessels of submucosa very large slight increase of round cells and polymorphonuclears in submucosa Muscular wall very much thickened

The term megacolon from the etiological viewpoint, is generally applied to the presumably congenital and idiopathic dilatation and hypertrophy of the large bowel which bears Hirschsprung's (20) name Finney (13) reminds us, however that several reports of the condition had appeared in the literature prior to Hirschsprung's original contribution in 1887 The designation then, of Hirschsprung's disease appears to be a tribute to careful observation and description

Hirschsprung believed since the constipation began at birth that the evil lying at the root must be considered either as an anomaly of development or a pathological fœtal process" Mya (37) however considered the dilatation congenital but the hypertrophy secondary Treves (52) thought that all cases were due to obstruction Hawkins (17) was of the opinion that a neuromuscular defect was responsible for megacolon an opinion concurred in by Mayo (34) and Perthes (41) viewed valve formation as the important etiological factor Kauffman (28) divides congenital megacolon into two groups, one conforming to the theory of Hirschsprung the other comprising instances of unusual length of the sigmoid colon with the formation of loops and valve like closures, or pressure by one loop upon another Marfan (32) contends that the malady is due to the unusual length of the sigmoid with the formation of kinks and the valve lock

The existence of an abnormally long mesentery connective tissue hyperplasia of the rectum chronic colitis, spastic contraction of the sphincter and increased length of the sigmoid are additional theories of *etology gathered from the literature* by Finney who states that no single factor accounts for all the cases. Finney believes that lymphangiectasis is of great etiological importance Aschoff (2) more recently wrote 'Enlargements of the intestinal canal usually appear above stenoses commonly the dilatation if its onset is not too acute is accompanied by a work hypertrophy of the musculature These dilatations may attain an enormous size especially in stenoses whose onset has been gradual or involving a valve To the last group probably also belongs Hirschsprung's disease the megacolon (Heller Konjetzny Perthes, Schmidt)

'According to most observers it here conducts itself as a valvular shutting at the juncture of the abnormally long sigmoid flexure in the rectum It is a congenital anomaly, which gives rise to a high grade dilatation and hypertrophy of the whole

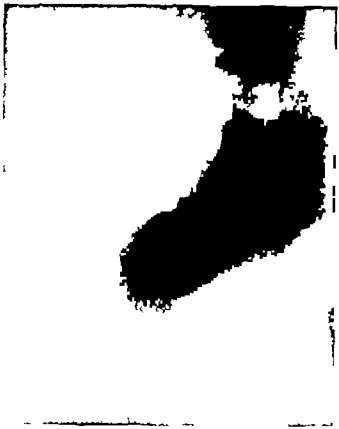


Fig 1 The unusual position of the stomach is explained by Figure 2



Fig 2 The giant sigmoid in comparison with the normal ascending colon

colon, by which the belly of the child is powerfully distended and its nourishment finally seriously endangered

This description of megacolon is quite generally accepted though in many of the reported cases, the sigmoid alone is involved

Somewhat analogous to the "valvular shutting" of Aschoff, is the 'angulation at the sigmoid" described by Delatour (11) Canthe, according to Delatour, ascribes to the constriction at either end of the sigmoid a definite sphincteric action Delatour conceives spasm here with resultant slowing of the faecal current, and a bending or sharp angulation of the heavy, redundant sigmoid at the rectosigmoid junction Intestinal stasis is thus perpetuated and a definite syndrome established The condition is demonstrated by roentgenography and the symptoms are relieved by resection of the sigmoid Angulation, then, links the symptomless, functioning redundant sigmoid with the true megacolon It is significant that Delatour notes the occurrence of the angulated redundant sigmoid in childhood with the statement that the child had always been constipated

Meyers (35) pertinently inquires what degree of hypertrophy and dilatation constitutes the so-called Hirschsprung's disease The roentgenograms of all cases of persistent constipation show that many of the sigmoids are looped twisted redundant dilated and hypertrophied and the past histories of these cases are practically identical Wagner (53) observes that the anatomical arrangement of the fixed rectum and the mobile sigmoid invites kinking

Wilkie (57) cites the case of a man 60 years old who had always been constipated At operation the pelvic colon only was involved and there was evident kinking at the rectosigmoid junction Wilkie believes that an exaggeration of the long sling like pelvic colon found normally in the infants is the cause of the disease.' There is no evidence that hypertrophy is found at birth, as contended by Hirschsprung and Kredel, but a kink or valve forms by sagging with subsequent dilatation and hypertrophy (Perthes)



FIG 3 The excised segment, contrasting the hypertrophied and the normal parts of the bowel

Bensaude and Sorrel (5) state that an abnormally long loop of bowel is frequently abnormally large in every direction. The sigmoid flexure is almost invariably involved in megacolon Bensaude and Sorrel found a kind of valve at the upper end of the rectum formed by simple kinking of the bowel

Hoffman (21) believed that volvulus and chronic kinking of the lengthened and dilated sigmoid loop were the causes of Hirschsprung's disease in ten instances

Bailey (3) concludes that megacolon may be due to any congenital defect that produces stasis either through mechanical or neuropathic interference with peristalsis

Although Walker (54) defines megacolon as a condition in which no definite obstructive lesion is found at operation or necropsy we contend in view of the reported discovery of kinks and valve formations at the recto-sigmoid junction that the likelihood of the unrecognized existence of such obstructions should be admitted

Marchand (33) in 1903 held the opinion that an early obstruction might result in dilatation and although the obstructive action soon ceases a secondary hypertrophy nevertheless, supervenes

Daniel (10) reported the case of an infant whose imperforate anus was opened on the second day Several years later Daniel operated for the relief of apparent megacolon The susceptibility of the infantile colon to obstruction seems obvious

Fenwick (12) notes that the appearance of the bowel in megacolon is exactly like that found above demonstrable obstructions hence the process is not a congenital pathological entity a view shared by Terry

Granting the probability of a valve like sigmoid obstruction there must in some instances at least be another factor at work since Ladd (29) Johnson (26) Stiles (48) and others have discovered enormous dilatation of the rectum also at operation Goebel (14) notes in this connection that surgeons are unable to demonstrate the cause of the dilatation which extends sometimes down to the anal ring Goebel suggests that anal spasms might be severe enough to induce a reflex irritation leading to lesions analogous to those of megacolon The local spasms of [illegible] sidered a condition. to remove the tendency to spasm The etiological importance of spasm was strikingly apparent to Popper (43) who was called to see twins 4 days old One twin had died shortly before Popper arrived The other appeared moribund with symptoms of shock, and an enormously distended abdomen No meconium or flatus had been passed since birth in spite of repeated enemata A glass tube forced with some difficulty through the sphincter entered the roomy rectum. Pressure upon the abdomen forced meconium and flatus out of the anus and immediate relief of symptoms and reduction of the distention ensued Since the dead twin had presented identical symptoms, Popper believed that both babies suffered from congenital megacolon The diagnosis, in the case of the living twin was subsequently confirmed by roentgenography

Meyers reports six cases of dilatation of the colon in children from 4 to 9 years of age The X ray examination revealed sigmoid redundancy in each instance, plus megacolon in one. The obstinate constipation was entirely relieved in five instances, including the case of megacolon by the administration of atropin since the bowels functioned normally after discontinuing medication

Fenwick observed spasms of the anal sphincter in a child in whom the dilatation and hyper

trophy extended right down to the anus and Holt (23) believes that the primary condition in megacolon is one of congenital hypertrophy, and that spasm is added to this

Regarding the frequency of megacolon, Ladd, in January, 1921 collected from the literature 113 cases to which he added five of his own, making a total of 118 Ladd concludes, therefore, that the disease is uncommon Hoffman (22), on the other hand, reviews 18 cases from Payr's service which were operated upon during the 10 years preceding March 1921 and believes that the condition is less rare than is generally assumed Smith (47) gathered 392 reports to October 1, 1915 The discrepancy between the figures of Smith and those of Ladd may be accounted for by the fact that the latter considers the majority of the adult cases doubtful, since the history usually does not date back to infancy or demonstrable mechanical obstruction exists We believe that most cases of megacolon are probably reported, since the striking objective signs, the remarkable X ray findings, the discovery at operation of a sigmoid limited in size, perhaps, merely by the confines of the abdomen and the subsequent surgical triumph or defeat, present a picture which invites description It appears, therefore, that the publication of approximately five hundred reports during the greater part of a century, would indicate the infrequency of megacolon particularly in view of the fact that many of the reports are based on a false premise (imperforate anus, for example), or lack roentgenographic, operative or post mortem confirmation

A consideration of the age at which megacolon occurs leads to the report by von Ammon (1) in 1842 of a case affecting a fœtus at the seventh month Potter (44) states however that von Ammon's observation is incomplete Finney cites several instances in which the abdominal distention of megacolon complicated delivery Popper discovered the condition in twins 4 days old, and Ladd considers megacolon essentially a disease of childhood an assumption based, naturally, upon the fact that Ladd's five cases came to operation at the ages of 2 months and 3, 6 7 and 9 years respectively

Dilatations of the colon beginning in adult life, from whatsoever cause have been termed "pseudomegacolon" by Hirschsprung Johnson, however considers such classification superfluous, if the term "megacolon" applies only when there is no demonstrable etiological factor Popper believes that megacolon is exceedingly rare, if not unknown, in the adult and Ladd states that it is occasionally possible for a patient to reach adult life with this condition but that most of the cases reported in the adult do not give a continuous history from infancy

The reports by Terry (50 2 cases) Wilkie Hubbard (24), Hawkins, Graves (16) Jackson (25), Herringham (18) and Johnson, of true megacolon in the adult are well authenticated since the symptoms, in each instance, dated from birth or early infancy and the diagnosis was confirmed at operation or autopsy One patient a man was operated upon at the age of 78 years by Herringham Hoffman however, in reviewing 18 cases of megacolon, 16 of which affected adults states that the picture of the disease may not develop until later in life The relative frequency with which megacolon occurs in childhood and in maturity is suggested by the statement of Patel (40) that of 223 cases which came to operation or necropsy only 73 were in adults

The preconceived notion held by one of us (Fowler), that gigantism usually involved the entire colon was proved erroneous by a survey of the literature. Among Ladd's cases for example there was only one instance in which the entire colon was involved in three others, the descending colon and the sigmoid were affected, and in the fifth the rectum sigmoid, and descending colon were involved Puls (45) analysis of 104 cases revealed the sigmoid alone involved in 35 per cent the entire colon in 27 per cent and the sigmoid either alone or with other segments in 84 per cent Mummery (36) noted that the sigmoid was chiefly affected in 80 per cent of the cases In Hirschsprung's two original cases the sigmoid was chiefly involved Neugebauer (38) stated that the sigmoid alone was the site of the disease in 74 out of 169 cases and Barrington-Ward (4) found all sigmoids dilated in 19 autopsies on children Brewer (7) in

writing of megacolon, states that there is chronic dilatation of the sigmoid and even of the greater part of the descending and transverse portions of the colon Blake (6) found the upper rectum and sigmoid enormous in a woman 24 years old and the mesosigmoid was so long that the sigmoid loop could be lifted 15 inches outside of the abdomen Finney observed that in more than one-third of the cases, the sigmoid alone was involved and in practically all instances it was included and Judd (27) believes that in practically all

megacolon affects the sexes Mummery records a prevalence in males in the proportion of 3 to 1

Although a familial tendency is exceedingly rare Popper reports the occurrence of megacolon in newborn twins More striking perhaps, is the observation by Graves of an instance of this malady in a woman 21 years old whose sister had died in infancy without a normal evacuation Welt Kakels (56) reported a similar case of colonic dilatation in an adolescent boy whose brother had died at the age of 8 years without having had a normal movement Machell (31) presents a well authenticated example of the familial tendency in his report concerning two brothers Operation upon the elder at the age of 3 years revealed dilatation of the entire colon and the rectum Necropsy on younger on fifteenth day disclosed dilatation of the entire colon with some thickening of the bowel wall Finney cites three instances of familial megacolon

peristalsis finally accompanied by signs of intestinal toxemia and usually resulting in early death This active acute process begins at birth or soon after and the dilatation and hypertrophy are present from the start Popper believes that a milder type beginning in early childhood and characterized by abdominal enlargement and severe constipation is probably acquired Most observers however consider the latter type true megacolon pursuing a chronic course

Stiles has observed children a few months old in whom constipation has been obstinate since birth and the mothers state that the constipation gets gradually worse and worse and the abdomen gets bigger and bigger The bowel movements at intervals of 2 or 3 weeks are loose and accompanied by colicky pains. Such diarrhoea is usually of short duration and is well tolerated but the terminal type observed by Hirschsprung is profuse and continuous with increasing prostration until death

Although vomiting is unusual Ladd notes that when the toxaemia markedly increases periods of vomiting and accentuated distention occur and dyspnoea and cardiac embarrassment may ensue. Such attacks demand prompt relief The typical picture according to Ladd is that presented by an emaciated child with a prominent abdomen the veins of the abdominal wall are conspicuous the dilated coils of the colon are apparent and masses can be felt within them The skin except over the abdomen is loose and dry the complexion sallow and the facial expression dull Enemata and catharsis are followed by copious offensive stools The X ray picture succeeding a barium enema confirms the diagnosis

Although Peskind (42) observes that the worst feature of megacolon consists of progressive nutritional disturbances the disease nevertheless, frequently pursues a decidedly chronic course Indeed Finney in accord with general opinion considers the malady to be essentially chronic. There is often as noted by Stiles Johnson and others a remarkable lack of subjective symptoms, with good appetite apparent good health and even gain in weight provided the bowel is kept relatively empty

The reaction to constipation varies. Hirschsprung treated an infant 7 months old who had had but one insignificant movement in 2 weeks yet the baby seemed free from ailment Linde (30) on the other hand noted signs of toxaemia or convulsions in his three-and a half years-old patient if 5 days were allowed to pass without an evacuation. Generally the immunity from toxaemia in the youthful sufferers from megacolon is surprising

Adults, however, develop even more striking immunity since stool free periods of weeks or even 3 to 4 months, induce only moderate auto-intoxication, mental torpor however is constant during fæcal retention

Instances of acute obstruction of the redundant sigmoid, usually volvulus have been reported In the case described by Critchlow (9) of a man 42 years old, there had been several previous obstructive attacks At operation Critchlow observed that the enormously dilated sigmoid loop had been forced by its gaseous content to the lateral and upper confines of the abdomen and the base of the loop was twisted The affected bowel unlike the uncomplicated megacolon did not present in the incision (This volvulus and the consequent remarkable distention of the sigmoid loop is beautifully illustrated in Hirsch man s (19) book.) Nuzum (39) reports the occurrence of acute obstruction of another type in a child 6 years old, who had always been obstinately constipated At operation for the relief of acute symptoms, megacolon and an obstruction due to kinking of the sigmoid in the pelvis were observed The enormous accumulation of fæces in the descending and pelvic colon of a 10-year old sufferer from megacolon was the unusual cause of acute obstruction in a case reported by Tewfik (51)

Hypertrophy is usually but not invariably present since Cadwallader (8) and Hawkins for example, each report a case of undoubted megacolon in which dilatation without hypertrophy was manifest In both instances the bowel was markedly dilated and thinned by gaseous distention In this connection Wilkie states that in the adult, dilatation can only follow the failure of the compensatory hypertrophy We believe however that the free or slightly obstructed redundant sigmoid may remain for years unchanged in its caliber and in the thickness of its walls but a suddenly increased obstruction at any time would be followed by dilatation of the bowel and a thinning of the wall

The diagnosis of megacolon in childhood, according to Ladd, should be relatively simple since the conditions which simulate it, chronic indigestion with constipation rickets tubercular peritonitis and acute obstruction

Finney observes is ordinarily not difficult since it is to be differentiated from tubercular peritonitis, some forms of chronic ileus annular carcinoma of the intestine dysenteric ulceration ovarian cysts etc

Of importance too in the differential diagnosis is the observation made by Finney that ascites does not accompany megacolon Although abdominal distention and obstinate constipation with freedom from objective symptoms are pathognomonic of the disease we are reminded by Peskind that there may be quite regular evacuations even eight or ten daily without appreciably decreasing the fæcal retention, a seeming paradox explained Ladd says by the fact that the liquid fæces finds its way around the solid masses without dislodging them

The treatment of megacolon seems essentially surgical yet Ladd discovered to his surprise that the surgeons suggested medical treatment and the clinicians advised operation Dietary regulation and improvement of hygiene with measures designed first to empty the bowel and second to establish normal peristalsis are the requisites of medical treatment Meyers observed in one case a predominance of starches in the diet A *rational dietary and the administration of* atropin resulted in apparent cure Griffith and Crozer (15) believe that operation is indicated only when the health begins to suffer and Ladd is of the opinion that non operative measures should be tried in the borderline cases before resorting to surgery Peskind considers the treatment chiefly medical operation being indicated only when the condition does not yield to rectal lavage or when obviously necessary in late cases to save life Johnson, on the other hand states that little is to be expected from medical treatment and one of us (Fowler) holds that the difficulty if not impossibility of bringing away the fæcoliths, is the chief bar to medical treatment It is evident, also in the pronounced case that the widely dilated sigmoid which has become, in fact, a reservoir could not reasonably be expected to empty

itself Indeed roentgenograms after medical treatment usually demonstrate that the size of the colon remains unchanged although Meyers reported one instance in which the bowel did appear to be smaller following the administration of atropin in a case of moderate severity The delay incident to a test of medical treatment would ordinarily be harmless even though such treatment proved ineffectual since the systemic disturbances of megacolon are transitory and disappear with the relief of the stasis In the advanced case, however medical treatment at best accomplishes merely partial removal of the retained feces at intervals Between times the patient is mentally sluggish with consequent decreased earning capacity if an adult and lessened enjoyment of life The dictum of Ladd that operation should be unhesitatingly advised in such instances should therefore be generally accepted

Surgical treatment aims of course at removal of the functionless bowel and restoration of the intestinal continuity The procedures vary according to the preference and judgment of the individual surgeon For example Johnson favors the single stage operation whereas Finney advocates a preliminary colostomy with secondary resection and anastomosis Johnson reminds us however of the liability to fecal contamination during operation due to the difficulty of pre-operative drainage of the liquid feces from the colonic reservoir Ladd also recognizes the danger of contamination since the ordinary types of intestinal holding clamps fail to occlude the hypertrophied bowel Only the heavy crushing clamps of Payr are effectual In the event of leakage the anastomosis must, of course be deferred Johnson performs an end to-end anastomosis with partial closure of the dilated lower segment but Ladd prefers an end to-side union Ladd emphasizes also the importance of passing a rectal tube through the anus and up beyond the anastomosis Resection and anastomosis in one stage, provided the patient's condition and faultless technique permit, is ideal When good judgment dictates a less radical course however the stage or stages beyond the first will be complicated by adhesions There can be no rule of procedure since each case presents its individual problems According to Wells (55) in writing of rectal carcinoma a colostomy is not the dreadful thing we used to think it was Patients have warning when the bowels are about to move and there is no soiling. In the treatment of megacolon however we [illegible] intestinal continuity the surgeon certainly should be Patel reminds us that the surgical mortality in infancy is high since under the age of 2 years thirteen deaths followed thirteen operations and after laparotomies between the ages of 2 and 5 years only four of fourteen patients survived Surgical treatment is not uniformly successful since Hawker Richardson (46) and Stiles each report a case in which dilatation recurred following operation

A statistical comparison made by Ladd of the results of medical and surgical treatment in megacolon, is interesting Sixty cases were treated medically with 41 deaths a mortality of 67 per cent 7 were cured 12 per cent 58 cases received surgical treatment with 24 deaths a mortality of 41 per cent 24 were cured 41 per cent Patel states that about 57 per cent of the 74 children and 57 per cent of the 41 adults who were subjected to operation were cured Ladd notes that the surgical deaths resulted from peritonitis due to technical errors rather than from intolerance of the operative procedures *per se* Neugebauer reported that medical treatment proved curative in only 1 5 per cent of 133 cases

The prognosis of megacolon according to [illegible] a precarious existence with the greatest likelihood of a fatal termination in infancy Stone (49) states that the deaths in early childhood are due to obstruction volvulus perforation toxemia or exhaustion Herringham, however reports a death from perforation in a man 78 years old

The admirably comprehensive survey of megacolon published by Finney in 1908

leaves little to be added Nevertheless, the theories regarding the etiology are as numerous as ever We thus find justification for this report and for a reassembling of the facts and fancies concerning megacolon together with an expression of our own views

SUMMARY

There is scant clinical verification of the theory that megacolon is a congenital pathological entity The normal tendency toward sigmoid redundancy in the newborn has been noted The sigmoid is always involved in megacolon and redundancy has been observed with striking frequency The anatomical arrangement—fixed rectum and mobile sigmoid—invites functional obstruction at the rectosigmoid junction and kinks and valve formations have been clinically demonstrated here. When such obstructions are not demonstrable, we may assume that they existed previously since the dilatation and the hypertrophy encountered in the so-called idiopathic megacolon cannot be differentiated from those which follow organic obstructions

CONCLUSIONS

1 The so-called idiopathic megacolon is relatively infrequent in childhood and rare in the adult

2 The only congenital feature of megacolon is the redundant sigmoid

3 The unobstructed redundant sigmoid may be nearly or quite symptomless

4 The degree of obstruction, from whatsoever cause determines the subsequent course

a Relatively slight obstruction (the 'angulation" of Delatour) produces a definite syndrome without dilatation or hypertrophy

b Acute obstruction (usually volvulus), either primary or superimposed upon hypertrophy, induces sudden dilatation and the desperate picture common to such obstructions

c Chronic obstruction causes gradual dilatation and compensatory hypertrophy, the type described by Hirschsprung

5 Kinking or valve-like action at the rectosigmoid junction is the usual cause of obstruction When the rectum, also, is involved, anal spasm is a likely factor

6 The surgical treatment of megacolon aims at removal of the crippled bowel and restoration of the intestinal continuity

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Note.—The excellent paper by Dowd entitled "The Surgical Treatment of Megacolon" appeared in *Annals of Surgery* for October 1921 after this paper had been accepted for publication

PATHOLOGICAL FRACTURES[1]

BY E. A. CODMAN, M.D., F.A.C.S., BOSTON

SINCE I have had little personal experience in the treatment of pathological fractures, my function has been to review the literature of this subject in order to give you in 10 minutes a résumé of present recorded knowledge concerning it. I will give a minute to each of ten headings.

1 The literature. Go to Eisendrath in Keene's *Surgery*. He will give you an excellent survey and quote largely from Grunert who reviewed the literature up to 1904 most thoroughly. If you want more references, the Registry of Bone Sarcoma has collected many for your service, but the articles contain little new except Bloodgood's dictum, "fracture as the symptom of onset in a central lesion suggests a bone cyst, and if the patient is 15 years of age or younger, it may be looked upon as almost pathognomic." This is likely to prove a diagnostic rule of permanent value.

2 Etiology. As secondary causes almost every human activity is mentioned, walking, running, coughing, sneezing, getting up or sitting down, and even turning over in bed. A pathological fracture implies a trivial cause acting on abnormal bone. I see no profit in listing these secondary causes as they are not important in diagnosis, prognosis or treatment, but we must in every case consider the possible pathological possibilities and not jump to the diagnosis of sarcoma too quickly. Eisendrath's table shows a list of possible causes.

EISENDRATH'S TABLE OF CAUSES OF *PATHOLOGICAL FRACTURE*[2]

1. Fractures resulting from bone fragility of local origin
   - A. Through tumors
     - a. Primary and metastatic sarcoma
     - b. Metastatic carcinoma
     - c. Adenocarcinoma from the thyroid (osseous metastases)
     - d. Enchondroma and benign osteocystic tumors
     - e. Metastatic hypernephroma
     - f. Echinococcus cysts
   - B. Inflammatory processes
     - a. Pyogenic osteomyelitis
     - b. Tuberculous osteomyelitis
   - C. Aneurisms
2. Fractures resulting from bone fragility due to some general disease
   - A. Neuropathies
     - a. Tabes dorsalis
     - b. Syringomyelia
     - c. Mental diseases (paresis)
   - B. Senile changes
   - C. Exhausting chronic diseases
   - D. Atrophy due to non-use
   - E. Scurvy

fragility of bone

3 Pathology. These fractures differ from ordinary fractures in other respects than in the trivial cause. They are more apt to be bendings, bowings, bucklings, telescopings and impactions. They are usually transverse, but may be oblique with one end of the fracture starting in the lesion. One such case in a true osteogenic sarcoma of the femur is recorded in the registry. As a rule the ends do not tend to separate widely or slip by one another. Yet they are not 'greenstick" but rather 'rotton wood" fractures. The ends have not life enough to spring into sharp fragments. These features probably account for the fact that such fractures are less painful than those in sound bones. This is particularly true in tabetic cases. I have not time to consider the pathology of the general lesions causing [illegible] symposium con

4 The path. [illegible] pathologists cannot or will not give us a standard nomenclature of bone tumors, I will venture with a certain amount of levity a safe surgical one.

a. Osteitis fibrosa. This includes ordinary bone cysts and the hæmorrhagic osteomyelitis of Barrie and possibly my next heading.

b. Bloodgood's giant-cell tumor, called myeloma in Canada and in Europe. These are benign but if they do not prove benign they belong in my next heading.

c. Giant-cell sarcoma. I do not mean sarcoma with giant cells, but an epulis-like tumor with "foreign body giant-cells" and an histological appearance indistinguishable to a

[1] From Keen's Surgery, vol. ii, 83.

Read before the Clinical Congress of American College of Surgeons, Philadelphia, Oct. ber 9 11

surgeon's eye from Bloodgood's giant-cell tumor *but which eventually proves malignant* The Registry of Bone Sarcoma is putting Bloodgood and Ewing on trial to see whether it is possible to discard this heading

d. True osteogenic sarcoma whether central or periosteal for they are usually more or less both These are definitely malignant, and as a rule easy to recognize clinically histologically and roentgenologically

e Metastatic new-growths, cancer hypernephroma, etc. A hopeless class.

f Multiple myeloma with or without albuminosuria.

g. Tumors of tissues which normally occur in bone as well as in other parts of the body such as nerves, vessels, and fat These are fortunately rare for histologically they make great confusion by causing secondary bone destruction and proliferation

h Tumors too common and well understood to include e g chondroma and osteoma and lesions of syphilis and tuberculosis

i. Tumors too rare and little understood by even pathologists for the surgeon to take them into practical consideration, e g the tumors of the specific marrow cells

5 Differential diagnosis A differential diagnosis is essential for proper treatment. Any of these tumors may be the cause of a pathological fracture Such diagnosis is largely histological but there are many clinical and roentgenologic points which Bloodgood has ably set forth To amputate the leg unnecessarily for a giant-cell tumor is almost worse than to procrastinate in a case of true sarcoma, for the results after early amputation in the latter are not very encouraging. Formerly I felt so hopeless in regard to amputation that I was lukewarm about even exploratory incision The registry has however found enough cured cases of the malignant type to convince me that amputation may be worth while and I now feel that exploratory incision should be the rule not only in cases of pathological fractures but in any bone tumor My association with Dr Ewing and Dr Bloodgood has made me feel that in the majority of cases with proper sections clinical history and X rays, an expert pathologist can make a differential diagnosis They will admit that a few borderline cases puzzle them It is in such cases that radium seems most applicable for it apparently benefits benign cases and retards malignant ones.

6 Prognosis With the exception of those caused by new-growths it is a rule that pathological fractures tend to unite without much delay Those due to carcinoma and other metastases rarely if ever do Those due to osteitis fibrosa cysts and giant-cell tumor eventually unite and a few cases due to sarcoma have been reported as uniting before death occurred Two of these were metastatic sarcoma.

7 The treatment is the appropriate treatment of the lesion which has weakened the bone Exploratory incision and expert pathological opinion are the first steps. It is not necessary to be very thorough in curetting wound should be opened widely and every bit of the current jelly tissue removed In malignant conditions amputation will be wise even if metastases are already present for these cases do not unite

Without convincing histologic opinion the experienced surgeon will not take off a limb when he finds a cystic cavity or red current jelly tissue at the site of fracture and he may amputate in spite of a negative report if he finds the soft tissues infiltrated with grayish malignant looking material. Where the fracture is the first or an early symptom the assumption should be that the cause is benign

In hopeless cases where amputation has been refused X ray radium and Coley toxins may be tried but the evidence collected thus far by the registry is not very favorable for any of these remedies in clearly malignant cases.

8 Prophylaxis If we may judge by the material thus far accumulated by the registry it should be a general rule to splint all cases of tumors of the long bones as soon as they are observed This applies particularly to tumors of the humerus and femur which are not supported by a companion bone as are the ulna radius, tibia and fibula Of 10 humerus cases pathological fracture was

found in 47 per cent, of 102 femur cases in 15 per cent, of 79 cases of the four self splinting bones in only 5 per cent As a total it occurred in at least 14 per cent of the 200 supposed cases of sarcoma of the long bones so far reported to us

I realize that this figure is inaccurate but I believe it is conservative, for in many of the cases included we have only a meager clinical history and no X rays The X ray often reveals an unsuspected fracture Then too fractures will occur in more of the cases after they are reported to us in their terminal stages I say supposed sarcomata for we are finding on analysis that very often a sarcoma is not a sarcoma at all But if 14 per cent of *supposed* sarcomata fracture from slight causes the rule applies to supposed sarcomata at least.

I know that Ewing has long felt that every sarcoma of a long bone should be splinted and kept in bed, on account of the danger of metastases Yet I do not think that surgeons have made this a general rule nor do I find it in the literature

9 *Theory* The subject we are discussing may be construed to include the question of whether fracture ever causes sarcoma The literature contains many articles discussing this proposition and great names may be found on both sides Fracture in a healthy bone calls forth the repair process we know as callus We know that callus may be exuberant and histologically resemble sarcoma confusing our best microscopists Suppose that the repair process starts and does not stop Would this be malignancy? The definition of malignancy given by most pathologists is a new formation of cells which proliferate continuously and without control Malignancy may be only an unbridled repair process and not the result of a stimulant emitted by bacteria protozoa or parasites We have been looking for a positive cause May not the cause be negative as by the removal of an inhibition? Without the fibrin ferment we bleed to death Perhaps without the repair checking ferment we repair to death?

10 *Research* In closing a review like this which is supposed to cover what we know of the subject may it not be well to suggest what we want to know? At present these so-called giant-cell tumors particularly are occupying the attention of pathologists May they not be due to rupture of nutrient vessels by fissure fractures? Suppose that the ruptured nutrient artery bleeds in the spongy bone as the temporal artery bleeds in some cases of fissure fracture of the skull A pulsating hæmatoma within the bone forms This is followed by pulsating granulation tissue which by pressure destroys the trabeculæ Intraosseous proud flesh is formed and new bone cannot compete with its pressure Will someone produce these tumors experimentally with fissure fractures or by trephining small holes and suturing large arteries in them? Cysts may be one stage of such lesions

In closing let me remind you of the existence of the Registry of Bone Sarcoma and the need it has for the record of every case that comes to the knowledge of any member of this audience

UNUSUALLY HIGH DEGREE OF LEUCOCYTOSIS FOLLOWING SPLENECTOMY FOR BANTI'S DISEASE

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THE following report is submitted because of the unusual degree of leucocytosis following splenectomy for Banti's disease which persisted for at least two months after operation without evidence of infection. Prince in the *Journal of the American Medical Association* 1915 reports a postoperative leucocytosis reaching 37,700 on the twenty-second day after the removal of the spleen for splenic anaemia, which subsided to 10,000 on the thirty-fourth day and a second case in which the spleen showed a chronic splenitis plus a typhoid abscess with a white count of 25,800 on the third day and 14,000 on the fourteenth day. Both these cases were without evidence of postoperative infection. A moderate degree of leucocytosis, from 11,000 to 13,000 appears to be the rule. No counts comparable to those here recorded have been met with in the course of our reading and they occasioned considerable alarm. Except for the elevation of temperature recorded there was no indication of infection, and the long period of time during which the patient was under observation makes it reasonable to suppose that any infective condition sufficient to cause such a leucocytosis would have made itself manifest.

R. S., male, white, single, age 49, entered the John Sealy Hospital February 24, 1920, dismissed July 23, 1920.

The father died at the age of 63 of Bright's disease. The mother is living and well, aged 83. [illegible] There is no his[illegible]

[illegible] 6 months no [illegible] years of age he [illegible] of the throat and spat blood. He was treated in various ways for 1 year and was finally cured by cauterization of the ulcers. Eight years ago he had a severe cough, lost some weight, but had no hemoptysis nor other indication of tuberculosis, and recovered completely in a few months. He had influenza in 1918, no complications. Two years ago all his teeth were removed for pyorrhoea. He denies venereal infection.

Patient came under the care of Dr. James E. Thompson February 24, 1920, complaining of weakness and loss of appetite and enlargement of the spleen. His illness began about 3 years ago; he became pale, lost his appetite and had occasional attacks of vomiting. A few months after the onset of [illegible]

the tumor himself. Since that time he has used numerous "tonics" but the loss of strength and weight have been progressive and the tumor has steadily increased in size. Lately there have been no vomiting attacks; there has never been hematemesis.

Physical examination. Patient had been well developed physically but showed extreme emaciation and muscular weakness. The skin over the whole body had a brownish discoloration much like sun tan, across the upper part of the abdomen and the chest there were a few areas which were free from pigment and these contrasted strongly with the dark color of the remainder of the skin. There was no eruption nor roughness in the discolored areas. There was no jaundice either in the skin or conjuctivæ; mouth was edentulous, tongue coated, slight pharyngitis was present. Lungs were normal [illegible]

findings.

A large tumor is found occupying the left side extending downward to the brim of the pelvis, and a handsbreadth across the middle line. The tumor is firm, smooth, not notched on the edge. No pain is elicited on pressure. The liver is not palpable [illegible]

[illegible]

shape and somewhat transverse in position. The extremities were negative except for a slight swelling of the ankles. The nervous system was negative; the genito-urinary system negative; urine negative

SUMMARY OF BLOOD EXAMINATIONS

BEFORE OPERATION

Date	Hemoglobin Per cent	Reds	Color Index	Whites	Polymorphonuclears Per cent	Lymphocytes Per cent	Large mononuclears Per cent	Transitionals Per cent	Eosinophils Per cent	Basophilic Per cent	Anisocytosis	Poikilocytosis	Polychromatophilia	Normoblasts
3-5	70	3,000,000	1.1	5,000	49	40	6	5						
3-7	40	2,952,000	0.8	9,500	66	22	7	5						
3-17	48	3,804,000	0.85	10,400	90	3	4	3		3	Marked	Marked	Present	Fair no
3-23	30	2,332,000	0.75	8,800	76						Slight	Slight	Some	Some
4-5	30	2,136,000	0.8	7,200	68	27	5				Some	one	light	neg
4-15	43	3,312,000	0.68	7,000	47	36		7			All examinations for malaria neg			
4-24	45	3,778,000	0.6	6,600	51	29		10						
5-5	60	3,160,000	0.9	7,600	60	30		5						

AFTER SPLENECTOMY MAY 16 1920

5-20	90	4,508,000		15,000	73		3		3		Present			
5-27	80	4,024,000	1	19,600	70	3				1				

The pulse rate was 80 to 90 blood pressure 120 systolic 80 diastolic. Blood examination on day after admission to hospital showed 1 900 000 red cells 27 per cent hemaglobin color index 0 7 white cells 5 000 Differential count of leucocytes 49 per cent polymorphonuclears 40 per cent lymphocytes 6 per cent large mononuclears 3 per cent transitionals 2 per cent basophiles The smears showed marked aniso-and poikilocytosis some polychromatophilia but no nucleated red cells For comparison the blood examinations both pre-operative and postoperative are tabulated at the end A diagnosis of splenic anæmia probably Banti s disease was made, and as the patient was not in condition to stand operation immediately Dr M L. Graves was asked to take charge of the medical treatment. Dr Graves treated patient with daily doses of Blaud s pills, sodium cacodyl strychnine and later cod liver oil. Early in April he added extract of red bone marrow to this Improvement was slow but fairly steady but the tumor showed no change in size There was still no increase in the size of the liver Patient was regaining strength and a little weight but was still much emaciated For the first month, as shown in the table the blood picture improved rapidly but after that time it remained practically stationary and as there was no hope of further improvement under medical treatment alone, operation was determined upon. Operation May 16 1920 Ether by Dr Carlker Patient took anæsthetic well. A median incision was used The spleen was very large, firmly adherent to the tail of the pancreas colon and omentum, but not to the parietes Splenectomy was done without great difficulty and with almost no loss of blood the peduele being tied with double chromic ligature, as were the bands of adhesions which were all very vascular The incision was closed with chromic mattress sutures in its upper part and continuous chromic stitches in the lower part with silkworm-gut tension and skin stitches No drainage was used. Respiration was shallow and rapid during delivery of tumor but after that satisfactory and at the close there was no shock The examination of the liver was cursory as it seemed advisable not to be overlong in the operation No abnormality was noted Convalescence No shock occurred after the operation and the first few days were without complications of any kind The healing of the wound was perfect the superficial stitches were removed on the eighth day and the deep tension stitches on the tenth day The temperature went up to 100 on the first and 101 4 on the second day and then for three days did not go above 99 Blood examination was made as a matter of interest on the fourth day and showed 11 000 white cells (See table) On May 22 the temperature went to 100 2° and for the next few days ran from 98 6° to 100 4° The leucocytes count, May 27 was 19 600 and a careful search for possible complications was made but without finding any thing to indicate infection. On May 29 the temperature reached 104 2 , but came down promptly after an enema From this date until June 9 it ran between 97 8° and 101 with no evidences of trouble except that a moderate enlargement of the liver made its appearance June 3 and rather rapidly increased in size. On June 9 the temperature went to 105° and for the next 3 days remained between 100° and 104° Throughout this period the patient experienced no discomfort the pulse ran between 80° and 108° the respiration was quiet and regular 24 to 28 there was no sign, in the general aspect, of serious illness When the temperature was high there was a slight headache but no chills, sweating nor prostration The leucocyte count was alarming on May 31 it reached 35,400 on June 3 it had dropped to 31,400 and on June 10 was 28 700 In view of this and of the very rapid increase in the size of the liver a possible liver abscess was considered On June 12 the liver was aspirated in three places but nothing was withdrawn except a

few drops of bloody fluid which were thought to come from the abdominal cavity The liver now extended to a hand s breadth below the costal mar gin and was slightly tender to pressure but the abdominal muscles were relaxed. Slight distention was present but this was readily relieved by ene mata June 12 to 16 the temperature ran from 99 in the morning to 103 the highest daily tem perature being reached at 9 00 or 10 00 p m On June 16 the liver was again aspirated without result From this date the temperature began to subside and was afebrile by June 23 After that date until his discharge from the hospital June 29 there was an occasional elevation to 99 but nothing higher About June 15 medicinal treatment such as had been used before the operation was again instituted and there appeared to be some in crease in strength and improvement in the general condition As will be seen from the table there was not any improvement in the red cells, which were at a maximum the fourth day after operation and then gradually fell to a count lower than the last pre-operative count There appeared to be a slight decrease in the size of the liver during the last week of the patient s stay in hospital and the tenderness over it disappeared completely It should be mentioned that there was no evidence of ascites during the convalescent period nor was there any icterus, as evidenced by coloring of the conjunctivæ The complete tabulation of the blood examination before and after operation is shown in table

Pathological report on the spleen Weight 5 pounds 9 ounces as removed without preservation The capsule was somewhat thick but not markedly so smooth except for bands of adhesions near the hilus where the colon and pancreas had been bound to it The cut surface was deep red, soft not diffluent, not very bloody It has much the appearance of normal splenic pulp except that the splenic cor puscles are obscured. Microscopic sections taken from the surface and from the depths of the organ have identically the same structure There is a fair amount of hæmatogenous pigment, but this is not a noticeable feature. There is slight increase in the thickness of the fibrous trabeculæ and capsule and the fibrous trabeculæ are rather closer together than is usual, so that there is a slight relative and a very marked absolute increase in the amount of fibrous tissue present There is an increased number of polykaryocytes so that there is no low field that does not contain one or more of these cells and they are larger than normal and vary considerably in size Many have the character of foreign body giant cells Many especially the larger contain more nuclei than are normal and numerous mitotic figures, but these are not atypical. These poly karyocytes tend to be arranged in groups. There is a loss of contour of the splenic corpuscles, which tend to be less sharply defined from the pulp than normally but the central artery is preserved and the corpuscles are, as a rule, easily recognized.

desquamation of swollen endothelium There is an increased number of normoblasts but no ab normal varieties of nucleated red cells. The red corpuscles throughout are greatly decreased and the small blood vessel contain very little blood (this despite the fact that the main vessels were ligated before the tumor was preserved and section not made until after fixation) Throughout the entire structure are many mast cells and fibroblasts and these tend to lie adjacent to the interlacing net work of fibrous trabeculæ

Pathological diagnosis chronic splenitis Banti type early stage

After history A report from this patient about November 1920 states that he was feeling better and was having no discomfort but did not regain strength No further direct report was received, but a notice of his death appeared December 11 1920 No details could be obtained

PENETRATING ABDOMINAL WOUNDS

By NATHAN WINSLOW M D F A C S Baltimore
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AUTHORS are too prone to publish their good results and to forget their failures. If progress is to be made in medicine failures should be recorded as well, for by this means alone will the statisticians be able to estimate properly the status of the subject under consideration With this object in view I have undertaken to collect and collate the abdominal penetrating wounds which have been observed in the various surgical services in the University Hospital Baltimore Whether or no there be any visceral lesion when the missile has passed through the peritoneum as far as this paper is concerned the lesion is classed as a penetrating wound If in addition, during its course, a hollow or solid viscus be injured the term perforating is employed, even though the most recent author ities restrict this designation more commonly to those injuries only involving the entire thickness of the wall of a hollow viscus If this classification be accepted trauma of the solid organ is spoken of as incised, lacerated punctured, etc. The purpose of this contribution is to emphasize the importance of a thorough abdominal exploration when in doubt as to whether the peritoneal cavity has been entered or not. In all bullet wounds no matter how remote the point of entrance when abdominal symptoms arise the abdominal viscera should be inspected If no damage to the intra-abdominal structures has been done the patient has only been put to a temporary inconvenience whereas if a hollow viscus be injured a life may be saved which otherwise would have been sacrificed A laparotomy is called for with especial force if the wound is located in the lower chest or far down in the abdomen The results obtained in this class of cases in a large metropolitan hospital should be of interest to the profession

Case 1 A. F a colored female of Baltimore age 30 housework was admitted to the University Hospital May 29 1917 at 10 a m for a gunshot wound of the abdomen incurred an hour earlier When brought to the hospital she was much shocked so was immediately stimulated Examination revealed a bullet wound in the right side of the abdomen several inches from the midline and on a level with the umbilicus Her abdomen was markedly distended and tender to the touch The belly wall was rigid throughout In addition there was a second bullet hole in the right buttock and The temperature

ther anæsthesia iodine technique—enterorrhaphy resection of ileum end to-end anastamosis—died

The abdomen was opened through a mid line incision On entering the peritoneal cavity it was found filled with free blood This was mopped out Further search revealed twelve holes in the ileum and eight in the mesentery Nine of the holes in the intestine and the eight in the mesentery were closed with fine silk sutures Three of the holes in the small gut were so close together and the bowel so badly torn that 3 inches of the intestine had to be resected The continuity of the intestinal canal was restored by means of a Murphy button end to-end anastomosis The patient was now very much shocked so the operation was concluded by the insertion of two rubber tubes and four cigarette drains into the pelvic basin and the abdominal wall closed in tiers down to the drains The woman did very well until June 14 1917 when she began to vomit frequently and persistently She lost ground steadily and daily became weaker and weaker Though assiduously stimulated she failed to rally and died June 28 1917

The Murphy button was passed June 14, 1917 From operation to date of death temperature was never normal, both night and morning indicating that there was some absorption going on. The temperature oscillated between normal and 104 the pulse 90 and 160, the respiration 20 and 40 Death was attributed to (1) bronchopneumonia (2) toxæmia, (3) exhaustion

Case 2 E O colored female of Baltimore laundress age 33 was admitted to the University Hospital September 11 1917 with the complaint of a gunshot wound of the abdomen She stated that while walking in the street she was shot by a man from the opposite side of the street The accident occurred about 2 p m. and she was rushed by the police patrol to the hospital On admission she was suffering considerable abdominal pain The abdomen was exquisitely tender throughout and the abdominal muscles were tense and rigid. The wound of entrance was on the left thigh immediately above the great trochanter and a little to its outer side The bullet finally came to rest in the right iliac region just beneath the skin so must have

coursed through the abdominal cavity transversely and slightly upward

Operation, September 11 1917 3 p m ether anesthesia, iodine technique—suture of perforated ileum and drainage of urinary bladder—recovered

The abdominal viscera were approached by a left rectus incision. On opening the peritoneum a small amount of bloody fluid was found in the abdominal cavity This was mopped out with sponges. Investigation of the alimentary canal revealed two perforations in the ileum These were closed with intestinal silk Further search demonstrated a hole in the urinary bladder A rubber tube was inserted into the rent, and the bladder sutured around it As the remainder of the abdominal contents were found to be uninjured, the operation was concluded by placing two cigarette drains to the pelvic floor and closing the abdominal wall in layers up to the point of emergence of the drains With the exception

were moving regularly and she voided urine without trouble

Case 3 W S colored male of Maryland age 35 laborer was admitted to the University Hospital, September 30 1917 for a gunshot wound of the abdomen He was shot about 4 p m and received at the hospital around 7 p m He was in fair condition The bullet entered the back over the right

quite rigid and tender throughout It was evident that the peritoneal cavity had been penetrated so operation was advised and accepted

Operation September 30 1917 8 p m ether anesthesia iodine technique—laparotomy and drainage —recovered

The abdomen was entered by means of a right rectus incision On opening the peritoneum, a small amount of free blood was found among the coils of the intestines This was mopped out Inspection of the liver revealed a perforating hole through the central portion of the right lobe the ball having passed through the upper pole of the right kidney before entering the peritoneal cavity Two drains were placed in the right renal fossa and in the hole in the liver and the wound closed in the usual way The patient was then placed on his left side iodinized and properly draped and an incision extending from the last rib above downward to the crest of the ilium, thereby exposing the kidney This disclosed a large hole in the upper pole of the kidney and a considerable amount of blood clot in the perirenal structures After wiping out the blood drainage was placed down to the wound in the kidney and the rest of the wound closed In order to guard against lock jaw a prophylactic administration of antitetanic serum was administered before the patient was returned to the ward He stood the operation well and was returned to his bed in very good condition. The postoperative course was extremely smooth and the patient left the hospital November 11 1917 The wound in his back was entirely healed the one in front discharging but slightly He was in good condition and pronounced recovered

Case 4. J K., colored male of Baltimore age 24 stevedore was admitted to the University Hospital, at 1 p m November 10 1918 with the history of

left of the mid line The abdominal muscles were rigid throughout and very tender to the touch. He was pale and in a state of collapse

Operation November 10 1918 2 p m ether anesthesia, iodine technique—suture of the small intestine colon, and mesentery—died.

The patient was on the operating table within an hour after admission to the hospital The abdominal

tine which was still actively bleeding This hemorrhage was controlled by introduction of a mattress suture of intestinal silk The peritoneal cavity was then mopped dry and a further search instituted for other damage This investigation revealed the presence of five perforations in the jejunum and two in the transverse colon which holes were closed with fine silk suture Other than the aforementioned,

duced through the upper incision. This likewise terminated in the pelvis The abdominal wall was closed with chromic catgut in tiers a tract being left for the emergence of the drain The patient was returned to the ward in fair condition He did well until about 6 30 p m then went into collapse from which he did not react and died at 9 p m November 10 1918

Case 5 B S white female age 8 school-girl

an inch from, and to the left of the median line There was no evidence of external hemorrhage The patient was pale and her pulse was rapid The abdominal muscles especially in the upper segment were rigid and very tender to the touch

Operation, December 15 1918 7 p.m., ether anaesthesia, iodine technique—laparotomy and drainage—recovered

The abdominal cavity was reached by a right rectus incision. On opening the peritoneal cavity it was seen that the bullet had furrowed the anterior surface of the liver and lacerated Glisson's capsule. The trough was not deep and there was but little oozing. In passing the hand over the upper surface of the liver a .22 caliber bullet covered with particles of clothing was recovered. The other viscera were found to be uninjured. Therefore a small stab wound was made close above the pubes through which a rubber tube was carried into the pelvic basin. Through the original wound a tube was placed in the subhepatic space and a cigarette wick on the anterior surface of the liver. This wound was then closed with the exception of the drainage tract. The patient was returned to the ward in fair condition and made a smooth and unruffled recovery being discharged cured January 4 1919.

Case 6. R. B., white, male, age 26, clerk, was admitted to the University Hospital, February 2 1919 with the complaint of a gunshot wound of the abdomen. He sought relief for a bullet wound accidentally received at 2 a.m. while standing on the sidewalk at Baltimore and Pine streets. The wound of entrance was in the sixth intercostal space in front. There was no wound of exit. His appearance indicated internal hemorrhage. The temperature was 99°, pulse 98, respiration 34. He was restless. The abdominal wall was rigid especially in its upper portion. It was thought that he had a bullet wound of the liver and perhaps of the pleura and lungs as on sponging the external wound little bubbles of air were mixed with the escaping blood.

Operation, February 2 1919, 4 a.m., ether anaesthesia, iodine technique—incision and drainage—died.

The abdominal cavity was reached through a high right rectus incision. When the peritoneum was opened a large quantity of free blood was seen lying between the coils of the intestines. This was

located penetrating the diaphragm. On account of the position of the wound it was considered inadvisable to prolong the operation in an attempt at suture, the accomplishment of which would require

—as introduced to
journey coursing
\ddditional drains
A small incision

was then made above the pubes, and a rubber tube carried into the pelvis. The abdominal wall was closed in tiers. Patient returned to ward in fair condition. Bullet not found, probably lodged in the liver.

February 3 1919. Since operation the patient has gotten progressively worse. The pulse has become weaker and weaker. His abdominal cavity is draining freely, for the most part serum. In spite of stimulants and supportive treatment he died. No cause for the death was discovered.

Anteriorly in the sixth interspace on the right side a foreign body could be palpated beneath the skin. The patient's abdomen was rigid and tender. The

—cured.

He was taken to the operating clinic within 2 hours after the injury and the abdomen entered by a high right rectus incision. On opening the peritoneum a large quantity of blood escaped. No wounds could be seen in the stomach or intestines, but on the anterior

tion, no attempt was made to suture the laceration

in the pelvis through a counter incision above the pubes. The abdominal incision was closed to drains and patient returned to bed in fair condition.

March 4 since the operation the patient has been

pected. An aspirating needle was inserted but no fluid obtained. The patient continued to run an irregular temperature until March 15 when the aspirating needle was again inserted in the right side of the chest, where there were suggestions of a collection of fluid and a small quantity of clear fluid was obtained. From that time the patient improved slowly but steadily and was discharged from the hospital April 6 1919 cured.

Case 8. R. T., colored male 17, laborer of Baltimore was shot at 7 p.m. October 19, 1919 and admitted to the University Hospital at 9 p.m. The injury was accidental and caused by a .32 cal. pistol ball. The missile entered the right side of the abdomen coming from a pistol in the hands of a man to the right and slightly to the rear of the patient. Operation October 19 1919 ether anesthesia, iodine

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did not perforate the bowel. The small intestine was also injured in two places without perforation. All three of the weak spots were sutured as precautionary measures against future rupture. No other damage could be found. There was no free

blood in the peritoneal cavity The abdominal wall was closed with catgut without drainage At the close of the operation, the patient was in good condition. One thousand five hundred units of antitetanic serum was administered Although this would have seemed a most favorable case for a rapid and speedy recovery the man developed a frank pneumonia of the lower lobe of the left side This complication ran a typical course and had cleared up by October 29 The man was becoming impatient and refused to remain in the hospital any longer so was discharged November 2 1919 The *temperature was normal, the incision entirely* healed and chest negative A fluoroscopic examination located the bullet lodged in the posterior part of his pelvis on the left side

Case 9 H R B white male age 16 painter of Maryland, entered the University Hospital Baltimore, November 13 1919, at 4 p m for gunshot wound of the abdomen He gave a history of having been shot in the abdomen 2 hours earlier He said he had been resting on a stump with the muzzle of a shotgun against his abdomen when on arising in some mysterious way the load was discharged He was in profound shock, pulse rapid 140 to the minute the respirations were sighing and thoracic in character The abdominal muscles were very tender and he resisted all attempts at palpation The abdomen was not distended To the right of the mid line and just below the umbilicus was a wound which was somewhat larger than a silver dollar

Operation, November 13 1919 iodine technique ether anesthesia—enterorrhaphy—died

A right rectus incision was made between the wound and the median line for the purpose of exploration When the peritoneal cavity was opened a large quantity of blood escaped and hissing of air was heard The large intestine was inspected and four perforations found two in the transverse and two in the upper part of the ascending colon These perforations were closed The small intestine showed no ev
developed a
admit a sm
gun-wadding
These were xtracted As the boy s condition was precarious, no attempt was made to suture this wound which was large and ugly instead the rent was stuffed with gauze Other drainage was placed in the subhepatic space, and the pelvis and the wound closed down to the drainage track The patient was returned to bed in a badly shocked condition and no hope for cure He died at 6 40 p m

Case 10 W G male colored age 29 chauffeur of Baltimore was wheeled into the ward at 10 a m November 28 1919 with a gunshot wound of the abdomen. He was shot about 7 30 a m. by a man with whom he had no acquaintance, because of the refusal of the loan of some money Examination showed a penetrating gunshot wound in the right upper abdomen below the eleventh rib The patient pulse nor appearance suggested internal hemorrhage He could give no clear statement concerning the direction of the bullet No bile escaped from the wound The impression was penetrating wound of the abdomen with probable injury to the ascending

drainage—cured

The abdomen was entered by a right rectus incision somewhat to the inner side of the wound of entrance There was a contusion of the anterior wall of the stomach in the neighborhood of the pylorus but apparently no penetration The liver was wounded in two places in its margin No further damage was found The bullet evidently left the peritoneal cavity through the suspensory ligament of the liver No hemorrhage was present No drains were used but the abdomen was closed tight The postoperative course of the patient was smooth He made a good recovery and was discharged from the hospital December 12 1919

Case 11 C S colored female housewife age 21 of Baltimore was admitted to the University Hospital, around 1 a m January 19 1920 for a pistol wound of the abdomen received an hour earlier The pain in her abdomen was so intense as to cause her to cry out She was intensely shocked

lower right quadrant A catheterized specimen of urine showed no blood.

Operation, January 19 1920 3 a m ether anesthesia, iodine technique—enterorrhaphy—died

The abdominal cavity was entered through the right rectus route When the peritoneum was

holes were closed by mattress sutures reinforced by a row of interrupted silk sutures As far as could be determined no further damage had been done the small intestine The cecum, sigmoid and rectum were undamaged The bullet was not located After the introduction of ample drainage both into the general peritoneal and pelvic cavities, the abdomen was closed down to the drains. As the patient was in very poor shape at the conclusion of the operation an incision was made down to the median basilic vein and 600 cubic centimeters of

normal salt solution introduced into the circulation Though actively stimulated the woman s condition became worse after the operation and she gradually sank without reacting and died at 2 a.m January 20, 1920

CASE 12 W S white male age 19 ex U S marine shot himself about 6 p m March 9 1920 He was admitted to the University Hospital the same evening at 7 p m Examination revealed a bullet wound in the left side of the thorax in the seventh interspace and a half inch to the inner side of the nipple line. The bullet lodged in the muscles of the back behind the lower ribs where it could be felt The abdomen was rigid, especially in the upper quadrant It was distended and somewhat tender to pressure. During the examination the patient vomited a small quantity of blood mixed with stomach contents. The breathing was distinctly thoracic. There were no symptoms of lung injury Obviously his stomach had been perforated He was in good condition. His pulse was fair and he was not greatly shocked There were no signs of internal hæmorrhage

Operation March 9 1920 9 p.m ether anæsthesia Iodine technique — gastrorrhaphy—pneumonia, cured.

On opening the peritoneal cavity some free blood was detected This was found to be issuing from a perforating wound in the left lobe of the liver the wound of entrance was sutured, that of emergence on the under surface of the organ was packed with gauze. Examination of the anterior wall of the stomach revealed a hole located about 2 inches from the pylorus and near the lesser curvature. This was closed by a purse-string suture which was reinforced by a line of Lemberts. Further search revealed, to

sutures of fine silk. The stomach was then delivered a hole made in the mesocolon and the posterior wall of the stomach searched for injury Here a per

the mesocolon was closed, and drainage of the lesser peritoneal cavity obtained through the gastrocolic omentum by rubber tubage. Fortunately for the patient he had not eaten since morning and there had been comparatively little seepage into either the general or lesser peritoneal cavity There was no pus in the peritoneal cavity but a plastic peritonitis had already set in Though the boy was in fair condition it was thought best not to prolong the operation by a search for the bullet Convalescence

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s di.

charged from the hospital 5 weeks after admission

CASE 13 J M white male age 71 farmer of Maryland was admitted to the University Hospital March 30 1920 about 2 30 p m in a semiconscious condition He was brought in for relief of a gunshot wound of the abdomen received about 48 hours prior to entrance to the hospital He was unable to answer questions intelligently but complained bitterly of pain. Two gunshot wounds were visible one of entrance in the right upper quadrant and another in the left hypogastric region He resented palpation There was marked abdominal rigidity The belly was though hard was but slightly distended Liver dullness was present He did not vomit after admission to the hospital

Operation, March 30 1920 ether anæsthesia Iodine technique—exploratory laparotomy drainage —died

A laparotomy was made through the mid line for the purpose of exploring the damage The abdomen was full of bloody matter and the viscera in the upper right quadrant were tied up by many adhesions A large hole was found in the hepatic flexure of the colon Through the vent thus created fæcal material was freely pouring As the intestine was too necrotic to suture and the patient in such a forlorn condition a rubber tube was inserted in the aperture and the gut attached to the parietal peritoneum This procedure with free drainage of the peritoneal cavity had to be relied upon to pull the man through Tucks and tubes were placed in the upper abdomen and the right lumbar regions and

inch below the cartilage of the seventh rib and 2½ inches to the right of the ensiform cartilage and a second bullet wound in the left lower quadrant This wound did not enter the peritoneal cavity There was an abundant exudate on and between the coils of the intestines The death was attributed to a generalized peritonitis from a perforating gunshot wound of the ascending colon

CASE 14 E. B., colored female age 18 housework sought the University Hospital about 5 p m June 23 1920 for relief of a gunshot wound of the right arm and abdomen The wound in the right arm consisted in the point of entrance solely The ball struck and shattered the humerus about the mid point. About halfway between the crest of the ilium and the last rib there was another hole a little posterior to the mid-axillary line On the opposite side of the abdomen but slightly anterior to the mid-axillary line over the tenth rib a similar opening could be seen. The woman was in a condition of shock the abdomen boardlike and tender and as she was evidently bleeding internally an exploratory laparotomy was suggested and accepted

Operation June 23 1920 6 30 p.m. ether anæsthesia Iodine technique—gastrorrhaphy—died

The abdomen was opened slightly to the right of the mid line through the sheath of the right rectus muscle The abdominal cavity was found to contain a large quantity of free blood, especially about the right kidney fossa A large jagged opening was found in the peritoneum just at the outer border of

profusely This was tightly packed with gauze as the liver substance was too lacerated to suture. In its further course the ball perforated both walls of the stomach a slight distance from its lesser curvature and about the mid point The openings in the stomach were closed, the one in the posterior wall being reached by an opening through the transverse mesocolon The spleen and both kidneys escaped injury The entire intestinal tract was examined without the detection of any further damage The pelvis was full of a sanguinous fluid Some stomach contents also were found in the peritoneal cavity The woman left the table in a condition of extreme shock and died about 10 p m June 23 1920 without regaining consciousness

CASE 15 M R colored male age 32 chauffeur of Baltimore was brought to the University Hospital at 7 50 p m November 14 1920 for a pistol wound of the abdomen The wound of entrance was in the epigastrium about 1 inches to the left of the mid line and somewhat above the level of the umbilicus There was no point of exit but the ball could be felt lying just above the anterior spine of the right ilium He was in good condition The pulse was 88 An hour later the pulse had run up to 104, and the abdomen had become quite rigid After admission he vomited but the vomitus contained no blood

Operation, November 14 1920 9 40 p m ether anesthesia, iodine technique gastrorrhaphy cured

The abdomen was entered through a high right rectus incision Upon opening the peritoneum a

thoroughly examined but no other damage was found A rubber tube with exit through a supra pubic wound was placed in the pelvis and appropriate drainage in the subhepatic space in close proximity to the stomach After closure of the wound the man was returned to the ward in good condition He made an uneventful recovery and was discharged cured December 26 1920

CASE 16 J D colored male laborer age 28 of Baltimore was admitted to the hospital at 12 30 a m December 25 1920 for a pistol wound of the upper abdomen received about a half hour earlier The point of entrance was immediately below the right costal margin and about 2 inches from the mid line

below the
mid-line

any; no nausea or vomiting The temperature was 98 6 pulse 90 mentality clear no signs of shock, slight pain. The general condition was good It was thought at entrance that bullet had not penetrated peritoneal cavity but examination clearly indicated penetration and probable perforation of a viscus.

Operation, December 25 1920 12 30 a m., ether anesthesia, iodine technique — gastrorrhaphy — cured

The abdomen was entered through a mid-line incision On opening the peritoneum a small amount of bloody serum was seen in the upper abdomen among the coils of the viscera Two perforations were found in the stomach near the greater curvature The point of entrance of the bullet into the

blood in the abdominal cavity but no intestinal contents had leaked through the hole The perforations were closed with a double row of silk Lembert sutures A tube drain was inserted into the left renal fossa
through the
forations
excellent co
but when an attempt was made to remove the rubber tube it was found to be firmly fixed so on January 11 1921 a left McBurney incision was made A finger inserted through this opening could feel the tube caught in a mass of omentum which had apparently twisted itself around the tube and gave to the mass a bulbous shape The mass was straightened out by a finger in the abdomen and drawn into the wound. The tube was then easily extracted

age 34 single laborer was admitted to University Hospital December 13 1920 at 8 a m, with the complaint of having been accidentally shot in the left side at 8 p m the preceding night by a friend who was cleaning a pistol The bullet traveled about 4 feet before striking him On admission to the hospital 12 hours after the accident, he was in a state of collapse his legs were drawn up his facies was anxious, his pulse rapid collapsed of poor volume and tension. His abdomen was rigid, painful and tender throughout and dull on percussion. The hole of entrance was located in the upper left abdominal quadrant 1 inch below the tenth costal margin in the mid-axillary line No wound of exit could be seen anywhere He voided his urine voluntarily but passed nearly pure blood The quantity was small On admission his temperature was 97 pulse 120 respiration 22 The clinical impression was (1) gunshot wound of the abdomen (2) internal hemorrhage (3) perforation of the hollow viscera including the urinary bladder

Operation, December 13 1920 ether anesthesia iodine technique — enterorrhaphy — gas infection died.

The peritoneal cavity was entered through a long left rectus incision Upon opening the cavity a large quantity of blood was found and mopped out No

active bleeding was detected, but five perforations of the small intestine, one of the mesentery and one into the urinary bladder were found and closed Drainage was obtained by two rubber tubes and four cigarette wicks The abdominal incision was closed in tiers down to the drains. The man left the table in poor condition. He did not rally after

20 and 45

Autopsy The body crepitated over both the upper and lower extremities. The usual incision from the suprasternal notch to the symphysis pubis revealed gas containing subcutaneous tissue

wound. The small intestine a number of sutured perforations. The bullet was found lodged in the soft tissues in the neighborhood of the prostate It was recovered.

Causes of death (1) hæmorrhage, (2) acute

heart.

CASE 18 C S white male mechanic aged 20 of Maryland came to the University Hospital June 1 1921 with the complaint of a gunshot wound of the chest and abdomen The point of entrance of the missile was above the right seventh rib, the point of exit on the same level just posterior to the posterior axillary line. The man was somewhat shocked and suffering some pain His respirations were jerky catchy and rapid. The abdominal muscles were very rigid. There was no evidence of pneumothorax, hæmothorax or marked intra-abdominal hæmorrhage. It was supposed that the bullet had traversed the costophrenic recess and passed through the diaphragm and liver so exploratory incision was advised and accepted

Operation, June 1 1921 8 p.m ether anæsthesia, iodine technique—exploratory laparotomy drainage—cured.

The injury was incurred about 4 p m so the patient was under operation about 4 hours after the wound was received Access was gained to the peritoneal cavity through a high right rectus incision It was found to contain no free blood. However the bullet had cut a gutter in the superior surface of the liver No other abdominal viscera were injured. A rubber tube was placed in the wound in the liver and brought out through the track made by the

man made an uneventful recovery and was discharged June 29 1921 entirely well.

CASE 19. G W colored, laborer male age 25 of Baltimore was admitted to the University Hospital about 10 p m June 20 1921 with a gun shot wound of the abdomen. The bullet entered the belly in the right lumbar region about 2 inches above the posterior superior spine. Pain shock the location of the wound and generalized abdominal tenderness left no choice other than an exploratory laparotomy

Operation, June 20 1921 10 30 p.m ether anæsthesia iodine technique—suture of the liver gastrorrhaphy—peritonitis died

Admittance to the abdominal viscera was obtained through a right rectus incision About a pint of free blood was discovered in the pelvis and lesser amount in the lesser peritoneal cavity A laceration in the right lobe of the liver was gaping and bleeding profusely Suture of this wound checked the further escape of blood from the torn liver vessel A wound 3 inches long in the anterior wall of the stomach in close proximity to the pylorus was closed by mattress sutures of silk, reinforced by a continuous Lembert The entire intestinal track was traced for perforation but none found. Two rubber tubes were carried into the lesser peritoneal cavity four cigarette drains in the upper right quadrant, and one tube and two cigarette wicks to the pelvis Particles of food such as meat peas, and potatoes were scattered throughout the peritoneal cavity The detritus was cleaned out as well as possible With the closure of the wound and the draping of the wound completed, the patient was returned to the ward in but fair condition

The morning following the wound was draining freely the drainage consisting to a large extent of bile The abdomen was fairly rigid but not distended No radial pulse could be found. The femorals were beating at the rate of 160 per minute Though the patient was conscious he was falling rapidly and died at 11 a m June 21 1921 Autopsy revealed a hole in the under surface of the duodenum overlooked at operation through which intestinal contents were leaking and a coexistent peritonitis

CASE 20 A. S white female age 28 house wife of Baltimore entered the University Hospital January 3 1921 suffering with a gunshot wound of the abdomen The wound of entrance was at the edge of the costal margin on a level with a point 2 inches below the xiphoid process and to the right The shooting occurred about 11 a m. and the patient was admitted at noon She was greatly shocked and complained of intense abdominal pain A catheterized specimen of urine was clear She vomited copiously but the ejecta contained no blood.

Operation, January 3 1921 1 30 p m ether an

incision extending from the chondral margin to the umbilicus. On incising the peritoneum a large amount of free blood and some clots were seen. These were limited mostly to the lesser peritoneal cavity It was seen that the bullet had passed entirely through the right lobe of the liver Bleeding

from this wound had ceased There was also a hole

evidence of injury to the retroperitoneal vessels nor to the left ureter or kidney The entire small intestine was eviscerated without result A hole was found in the transverse mesocolon, but there was no bleeding at this point No perforation could be found in either the transverse or descending colon. There was, however considerable emphysema of the mesentery of the sigmoid but no hæmorrhage from, nor injury to the sigmoid could be demonstrated Examination of the pelvic organs showed the uterus to be the size of a 3 months pregnancy After the institution of appropriate drainage and the closure of the wound with the exception of the path through which the drains emerged the patient was returned to her ward She was only in fair condition The patient did not do well and died at 1 25 a m January 7 1921

Autopsy revealed a pin hole in the under surface of the sigmoid through which liquid intestinal contents were escaping and a co-existing generalized pentonitis, and bronchopneumonia

Case 21 G L colored male laborer age 33 of Maryland was brought to the University hospital about 8 p m April 9, 1921 with the history of having been shot in the abdomen at 5 30 p m Examination showed a bullet wound just below the costal margin and 4 inches from the mid line on the left side In the left side of the back just beneath the skin, between the ilium and ribs, the bullet was felt The patient was unable to walk He was suffering intense pain The abdominal wall was very tense, rigid, and painful to touch throughout its entire extent

Operation April 9 1921 ether anæsthesia Iodine technique—enterorrhaphy—died The abdomen

ileum and one in the transverse colon near the splenic flexure All of these holes were closed with fine silk Examination of the entire intestinal tract failed to disclose any other damage Drainage of the pelvis was obtained through a stab wound above the pubes the general peritoneal cavity by cigarette tucks through the abdominal incision The patient was returned to bed in fair condition He did not do well after operation carrying a temperature varying between 98° and 103 and died April 14, 1921

The autopsy revealed pentonitis as the cause of death

Case 22 J H white male laborer age 44 of Baltimore was admitted to the University Hospital in a delirious condition with the history of a gunshot wound of the abdomen Examination showed the patient to be in a markedly shocked condition The radial pulse could not be obtained

The skin was cold and clammy and the patient was covered with a cold sweat The hole of entrance was located on the right side just above the anterior superior spine that of exit just below the great trochanter of the left side The man was infused before being taken to the operating room.

Operation May 17 1921 ether anæsthesia Iodine technique—resection of the ileum—died.

toneal cavity as suspected was full of blood both free and clotted The mesentery supplying the ileum was badly shattered and the ileum itself was torn so extensively as to make a resection imperative Restoration of the continuity of the bowel was obtained by means of the Murphy button. Drainage was obtained by cigarette tucks and rubber tubes to the general and pelvic peritoneum After the incision was closed, and before the patient was returned to his bed, a prophylactic injection of antitetanic serum was administered The man never recovered from his collapse and died several hours after the completion of the operation. The autopsy revealed nothing of interest Death was

Hospital July 4 1921 for a gunshot wound of the abdomen He gave the history of having been shot with a stray bullet while walking in the street On admission he had an anxious expression, but was apparently in no great pain His pulse was 80

inches below the level of the umbilicus and about an inch external to and to the right of the mid-line from which at least 6 inches of omentum was protruding No wound of exit could be found The voided specimen of urine was negative for blood

Operation, July 4 1921 ether anæsthesia Iodine technique—enterorrhaphy—died

The abdomen was entered through a right rectus incision The original wound and protruding omentum was not disturbed The projecting omentum

[illegible] blood in the peritoneal cavity The gastro-

of suture reinforced with a continuous Lembert There were two perforations in the cæcum, one in its anterior and one in its posterior wall. Both wounds were on the appendiceal side of the ileo-

cæcal valve Both were closed by two rows of sutures. The bullet left the peritoneal cavity behind the cæcum and just external to the internal iliac vessels. As no other injury to the abdominal viscera could be found, appropriate drainage was instituted the incision closed as far as possible, and the patient returned to the ward in fair condition

The postoperative course of this patient was stormy and unfortunate. He first threw off a bronchopneumonia, then his wound broke down and finally he developed a fecal fistula, and died July 24 1921 at 6 30 a.m. of inanition

CASE 24 N T colored male age 25 of Maryland stabbed July 3 1917, at 11 30 p.m. on the operating table at 12.45 a m returned to the ward at 1.45 a.m. and died at 4.45 p m July 4, 1917

He was brought to the hospital in an ambulance with the history of having been stabbed in the abdomen 4 days previously He had received first aid and at the time of his reception at the hospital had a dressing on the wound He was suffering but little pain. His temperature was 99 3/5 pulse 104, respiration 32 His general condition was poor and little hope was held out for his recovery After being placed in bed, examination revealed a somewhat painful and tender abdomen, rapid and shallow respirations, a quickened and small pulse an anxious facies. Over the left lateral wall of the abdomen was a wound which admitted the tips of two fingers It was discharging a very foul smelling bloody serum. The abdominal walls were very tense thoughout. The patient was bathed in a cold clammy sweat.

Operation July 4 1917 12.45 a.m ether anæsthesia, iodine technique—enterorrhaphy drainage—peritonitis, died

The abdominal contents were reached through a left rectus incision. Upon opening the peritoneum the intestines were seen to be covered with large flakes of fibrin and they were intensely red and injected. The peritoneal cavity contained a large amount of a yellowish foul-smelling material A perforation, the size of a quarter of a dollar was found in the descending colon from which was escaping freely the intestinal contents. This was sutured and the peritoneal cavity flushed out with hot salt solution. Both the general and the pelvic peritoneum were drained with tube and gauze and the wound closed down to the drains. The patient was returned to the ward in poor condition He never reacted but gradually failed and died at 4.45 p m., July 4, 1917 There was very little drainage from the tubes in the abdomen.

CASE 25 M B colored male age 30 laborer, of Baltimore was admitted to the University Hospital at 3 15 p m. O
the abdomen
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abdomen, once in the right epigastrium and once at a lower level and to the left of the mid line. From the latter wound, a piece of omentum was protruding. Both wounds were about an inch in length. The one on the right side was situated immediately over the liver and just below the costal margin The second wound was located slightly below the umbilicus and about an inch to the left of the median line

Operation October 11 1918 ether anæsthesia iodine technique—exploratory laparotomy drainage—cured.

The abdomen was entered through a right rectus incision After opening the peritoneal cavity the omentum was withdrawn, ligated, and excised With the exception of an incised wound in the anterior surface of the liver inspection of the abdominal viscera was without result. A quantity of blood had escaped from this wound and as it was still oozing the gap was closed with a mattress suture of silk. All three peritoneal cavities were drained, the pelvic through a stab wound above the pubes The original incision was then closed as far as the drainage permitted and the patient returned to bed in fair condition This man's convalescence was without incident He was discharged November 18 1918 cured.

CASE 26 G U white male tailor age 41 of Baltimore was admitted to the University Hospital February 15 1919, with the history of having assaulted his wife who in retaliation punctured his abdomen with a pair of scissors The patient was a Lithuanian and could not speak English so no other history could be obtained.

Operation, February 15 1919 ether anæsthesia iodine technique—exploratory laparotomy drainage—cured.

The wound was located in the right epigastrium a little to the right of the mid line. As there was some doubt as to whether it had penetrated or not the operative incision was made through the trauma. This revealed that the wound led into the peritoneal

omentum was tied. A hand in the pelvis detected a considerable collection of liquid blood This was mopped out. Several drains were placed in the pelvic basin through a counter incision in the lower abdomen Drainage of the upper abdomen was taken care of by appropriate measures and the remainder of the abdominal incision closed The man made an uneventful recovery During his stay in the hospital he displayed an unbalanced mind so he was transferred March 17 1919 to an institution for the insane, but cured as far as the abdominal lesion was concerned.

CASE 27 B N., white male sailor age 37 of Germany entered the University Hospital, July 20, 1919 for a stab wound of the left side The wound was about 1 inch long and was situated in the left side of the abdomen on a level with the umbilicus

[illegible] by a physician

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id tender to the
touch

GUNSHOT WOUNDS OF THE ABDOMEN

No.	Died	Recovered	Race	Age	Sex	Occupation	Operation—hours After Injury	Complications	Hollow Viscera Injured	Solid Viscera Injured	No Viscera Injured	Operation
	Yes		C	30	F	Housewife		Pneumonia Torpidity Exhaustion	Ileum, holes	Mesentery 8 holes		Laparotomy Resection of intestine Murphy button, anastomosis, drainage
		Yes	C	33	F	Laundress		Abscess left buttock	Ileum, holes Urinary bladder			Laparotomy, drainage of bladder by rubber tubage drainage
3		Yes	C	33	M	Laborer	4			Liver kidney		Laparotomy drainage
4	Yes		C	44	M	Shoemaker		Hemorrhage Exhaustion	Jejunum holes Colon holes	Mesentery		Laparotomy drainage
5		Yes	W	8	F	Schoolgirl				Liver		Exploratory laparotomy drainage
6	Yes		B	26	M	Clerk		Wound in chest Hemorrhage exhaustion		Liver Diaphragm		Exploratory laparotomy drainage
7		Yes	B	9	M	None		Pleurisy		Liver		Exploratory laparotomy drainage
8		Yes	C	7	M	Laborer		Peritonitis	Perforation of small intestine and colon			Laparotomy suture of contused ulcer, drainage
9	Yes		W	6	M	Painter	3	Extensive hemorrhage	Colon holes	Liver		Laparotomy drainage
10		Yes	C	29	M	Chauffeur	3		Contusion of stomach	Liver		Exploratory laparotomy no drainage
	Yes		C		F	Housewife	3	Hemorrhage shock	Ileum holes	Mesentery		Laparotomy drainage
		Yes	W	9	M	ex Marine	3	Peritonitis	Stomach holes	Liver diaphragm		Gastrorrhaphy suture of liver drainage
3	Yes		B	7	M	Farmer	48	Peritonitis	Colon, hole			Insertion of tube in colon, drainage
4	Yes		C	8	F	Housework		Collapse	Stomach holes	Liver		Gastrorrhaphy drainage
5		Yes	C	33	M	Chauffeur	3		Stomach, holes			Gastrorrhaphy drainage
6		Yes	C	28	M	Laborer		Retention of drainage tube	Stomach, holes			Gastrorrhaphy drainage
7	Yes		C	34	M	Laborer		Hemorrhage Peritonitis Gas infection	Small intestines 3 holes, urinary bladder hole	Mesentery hole		Laparotomy suture of the urinary bladder drainage
8		Yes	W	29	M	Mechanic	4	Wound in chest		Liver		Exploratory laparotomy drainage
19	Yes		C	23	M	Laborer		Peritonitis Hole in duodenum not included	Stomach, hole Duodenum, hole	Liver		Gastrorrhaphy suture of liver drainage
20	Yes		W	28	F	Housewife	6	Peritonitis Hole in sigmoid not included	sigmoid, hole	Lower pancreas, Lesser omentum		Exploratory laparotomy drainage
	Yes		C	21	M	Laborer	3	Peritonitis	Ileum, 3 holes Colon hole			Enterorrhaphy drainage
	Yes		W	44	M	Laborer		Hemorrhage Collapse	Ileum, large hole	Mesentery		Resection of ileum, anastomosis by Murphy button, drainage
1	Yes		C	4	M	Schoolboy		Pneumonia, fecal fistula Intussusception Secondary hemorrhage	Ileum, 3 holes Cecum, 2 holes			Enterorrhaphy drainage

STAB WOUNDS OF THE ABDOMEN

No.	Died	Recovered	Race	Age	Sex	Occupation	Operation after Injury	Complication	Hollow Viscera Injured	Solid Viscera Injured	No Viscus Injured	Operation
24	Yes		C	25	M		06 hrs	Peritonitis	Colon			Enterorrhaphy drainage
25		Yes	C	20	M	Laborer	4 hr			Liver		Suture of liver drainage
26		Yes	W	4	M	Tailor	Soon	Insanity		Omentum		Laparotomy drainage
7		Yes	W	27	M	Sailor	Soon		Jejunum, 3 holes	Mesentery		Enterorrhaphy ound closed
28		Yes	C	23	M	Laborer	1 h				Yes	Laparotomy no drainage
29	Yes		W	6	M	Schoolboy	4 hrs	Shock	Stomach	Spleen		Gastrorrhaphy drainage
30		Yes	C	29	M	Laborer	hrs	Slight supper tion abdominal wall			Yes	Laparotomy drainage
31		Yes	C	8	M	Messenger	hrs			Omentum		Laparotomy drainage

Operation, July 29 1919 ether anæsthesia iodine technique—enterorrhaphy—cured.

The incision was made through the left linea semilunaris. The jejunum was found to be punctured three times and the mesentery once There was as a result a hæmatoma of considerable extent between the layers of the mesentery The wounds in the gut were closed with fine silk. The only drainage was rubber tissue to the bottom of the stab wound thus permitting a tight closure of the operative wound After an uneventful course the man was discharged August 9, 1919

CASE 28 F T colored male laborer age 23 of Baltimore was admitted to the University Hospital October 16 1919 for a stab wound in the left tenth costal interspace. It was about one half inch long and deep. That it entered the peritoneal cavity was *evidenced by the projecting of a piece of omentum* through the wound. There were no signs of intestinal perforation or peritonitis The man was in good condition the pulse 110 The abdomen was not distended or dull There were no signs of concealed hæmorrhage

Operation, October 16 1919, ether anæsthesia, iodine technique—exploratory laparotomy no drainage—cured.

The wound was in the mid axillary line and had been received early in the morning He was on the operating table about an hour after the injury was incurred The abdomen was entered by following the original wound. No visceral injury was found The protruding omentum was cleansed and allowed to drop back into its natural habitat and the wound was tightly closed The postoperative course was smooth by the 17th the patient's temperature was down to normal and he was suffering no pain or discomfort of *any sort. He refused to remain* in the hospital any longer so was discharged October 20 1919 At that time his general condition was very good.

CASE 29 W O white male schoolboy age 6 was brought to the University Hospital June 26 1920 in a very serious condition. About 6 o clock that afternoon the patient fell from a load of hay the prongs of a pitchfork entering the left side of his chest and abdomen The boy's respirations were hurried and his pulse fast. The abdomen was quite rigid The whole left side of the chest was emphysematous. The temperature was 103 8 pulse 138

Operation, June 26 1920 ether anæsthesia iodine technique—gastrorrhaphy—died

The abdomen was entered by the lowermost prong which penetrated the soft tissues from behind the posterior axillary line and just beneath the costal margin. The abdominal cavity was entered through a left rectus incision. Inspection of the upper abdominal viscera showed the prongs to have entirely penetrated the spleen and to have entered the posterior wall of the stomach The latter wound was sutured and capped with a piece of omentum The lesser peritoneal cavity and splenic shelf were *drained with one rubber tube and three cigarette* wicks The boy did not rally after the operation and died o p m June 020

curred during an altercation with a colored woman 2 hours earlier Although more than 10 feet of the small intestine were resting on the outside of the belly wall the man was quiet and in no great pain The gap in the abdominal wall was some 3 inches long and running along the outer border of the left rectus muscle, from *without inward and slightly* obliquely downward The pulse was not greatly accelerated and the respiration was quiet The man was in no shock and had apparently lost very little blood.

Operation, August 29 1920 ether anæsthesia iodine technique—exploratory laparotomy drainage —cure.

While the skin was being cleansed the protruding intestines were protected with a sterile towel. Before inspecting them for possible perforation or other damage they were washed off with normal salt solution The toilet having been completed the abdominal wound was enlarged *at both its upper*

and lower extremities and the intestine then inspected carefully for trauma As none was found the gut was returned to the abdominal cavity One

dition With the exception of a slight superficial suppuration, the patient made an uninterrupted recovery and was discharged from the hospital September 25 1920 with the wound entirely healed save epithelization of the drainage site which was however closed in up to the skin. He gave a 100 per cent Wassermann

CASE 31 T H colored male delivery boy age 18 of Baltimore was admitted to the University Hospital August 14, 1921 for a stab wound through the lower part of the left rectus abdominus muscle The wound was located 2 inches below the umbilicus and in the mid-axillary line There was no doubt that it had penetrated, as witnessed by the protrusion of 2 inches of the omentum The belly wall was very rigid, but the pulse was good The wound was inflicted about 2 hours before admission

Operation, August 14, 1921 ether anesthesia iodine technique—exploratory laparotomy drainage —cured

The abdominal contents were explored through a lower left rectus incision Investigation of the entire intestinal tract was without result Several bleeding points in the omentum were ligated The section of omentum exposed to contact with the wound was resected and withdrawn through the knife tract The stump was washed off with alcohol and allowed to drop back into the peritoneal cavity One cigarette tuck and one tube were placed in the pelvis and one cigarette wick to the left kidney shelf The abdominal wall was closed with the exception of the point of emergence of the drains The boy was returned to the ward in good condition With the exception of a moderate rise in temperature and pulse rate the patient made an uneventful recovery and was discharged September 21 1921 cured

These cases, 31 in number were observed during the period from January 1 1917 to September 1 1921 Sixteen recovered 15 died 25 were males, 6 females 19 were colored 12 white 23 were gunshot wounds 8 stab Of the stab wounds 2 died 6 recovered of the gunshot 13 died 10 recovered Of the gunshot wounds the hollow viscera were perforated 16 times with four recoveries 3 of which were of the stomach Of the perforations below the pylorus 11 in number but 1 recovered Of the 10 cases of gunshot wounds that got well 2 involved the stomach 1 the stomach and liver 1 the jejunum and urinary bladder 3 the liver 1 the liver and kidney 1 a bruise of the small intestine and colon and 1 a contusion of the stomach There is a possibility that five of the last six would have recovered operation or no operation Until some method is devised however whereby the damage done can be accurately ascertained direct inspection of the abdominal organs offers the best hope of cure to these patients as with the means at hand nobody can foretell before operation the lesion In 2 instances perforations in the hollow viscera were overlooked and these patients promptly succumbed to peritonitis This has been the invariable rule with this type of cases in our clinic Never have I seen a case of overlooked perforating gunshot or stab wound of a hollow viscus recover that such a fortunate outcome may occur I am not prepared to contradict, but it has not been my good fortune to witness such a happy turn of events Twelve of the deaths in the gunshot series occurred in cases in which the hollow viscera were perforated Only 1 of these occurred in 4 perforating wounds of the stomach leaving 11 deaths assignable to perforations in the small or large intestine a mortality of 91 66⅔ per cent Though the series is small and the mortality high this is no brief against operation as a possible 8 and a fraction recoveries in every 100 cases is far better than 100 deaths. The stomach series is a little more cheering in as much as there is a percentage of 75 per cent cures.

All of the deaths except two from the oversight of holes in the gut were due to unavoidable causes for the most part collapse from internal hemorrhage One is forcibly struck by the number of these accidents complicated by lung affections In 4 instances the injury was followed by pneumonia in 1 by pleurisy In 1 case the death was attributed to gas bacillus infection One patient was received 96 hours after the accident 1 48 hours, 1 12 All of them died All the rest were admitted from ½ to 4 hours after the receipt of the trauma

Of the stab wounds three perforated the hollow viscera Only one recovered 33⅓ per cent. Case 24 was without operative treatment for 96 hours and was in poor condition.

He was operated on only with the idea of giving him a chance for recovery In Case 30 the patient came into the hospital supporting with his bare hands 10 feet or more of small intestine coiled up on the outside of his abdomen Fortunately the bowel was not injured and the man eventually made a good recovery Though the result in the above series is not overly gratifying, it is no brief against the use of exploratory laparotomy

None of the cases died in which no damage or but little damage was detected and two did succumb in which a hole in the bowel was overlooked Although Captain Basil Hughes R.A.M.C.[1] reports 10 soldiers with such injuries who were not operated upon with 11 sent to the base 3 of whom developed fæcal fistula, and 5 of whom passed blood per rectum civil practitioners are not yet prepared to adopt non-operative measures when these patients are received sufficiently early after the receipt of the injury until a better method of handling these cases has been proposed tried, and proven

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THE REMAINING BREAST AFTER RADICAL REMOVAL OF THE OPPOSITE SIDE FOR CARCINOMA[1]

By HUGH H TROUT M.D F A C S., ROANOKE VIRGINIA
Surgeon-in-Chief Jefferson Hospital

IN a review of one hundred and seventy three operations for carcinoma of the breast necessarily many interesting and some instructive facts have been ascertained One of the most useful results of such an analysis I believe will usually be found to be the information so acquired is so disappointing regarding his permanent cures as to lessen the conceit of the average surgeon

I will not present even a résumé of the results of our studies in this series further than to discuss briefly the future of the remaining breast, giving especially consideration to that rather small group of women coming within the childbearing period and having cancer of the breast. It is more than likely such a consideration would not have occurred to us had we not happened to have had visits from two such patients within a very short period of time Both of these visits being so close together and presenting such an unusual condition of affairs, naturally focused our attention on the necessity of reviewing all our cancer of the breast cases with the object of ascertaining what effect pregnancy had on the remaining breast after the patient had already exhibited to say the least a tendency to cancer by having been the host of such a disease on a previous occasion

With such an object in view we ascertained there were only thirty-one of these cases in our series under the age of 40 years We were successful in obtaining information concerning twenty nine of this thirty-one and of this number only two had become pregnant and the most important point of this study hinges on the fact of both of these cases having developed carcinoma in the remaining breast.

Very briefly the essential facts of these two cases are as follows

CASE 1 age 34 first admitted April 16 1912 with carcinoma about 4 centimeters in diameter in upper outer quadrant of left breast Known duration of tumor about 8 months. Mother of three children—12 8 and 4 years. Nursed all children without trouble and with sufficient milk in both breasts. Tissue and glands removed from axilla and from under the falciform or triangular ligament did not show any signs of malignant invasion. No glands were palpated in supraclavicular region

about 1 month before her return to hospital on

due to the existence of a months pregnancy During the month in which patient watched the growth of the tumor it increased very rapidly and when examined suggested a zone of inflammatory infiltration for several inches around the tumor Another radical operation was done revealing a carcinoma of the upper outer quadrant without involvement of the glands of the axilla and having no attachment to the chest wall

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further pregnancies, having been instructed to use all possible precautions to prevent them Sections of this tumor were sent to Dr W H Welch, and Dr J C Bloodgood, both of whom also gave the diagnosis of definite malignancy

CASE 2 Age 32 first admitted June 14, 1911 and differs only from Case 1 in the following respects Mother of one child of 12 years After an interval of about 6 years, patient returned on June

reported to us, not only was the breast involved but the patient presented many signs and symptoms of a general carcinomatosis. The patient stated when she first noticed the growth that it was not larger than a small marble and as far as could be ascertained from her history she did not have any symptoms of chest or abdominal involvement until about 1 month before her return to the hospital. No operation was advised, but she died on June 18 1916 The family refused to allow an autopsy

[1] Read before the Southern Surgical Association, Hot Springs, December 1916.

so all the information we could obtain was through an abdominal incision which the undertaker was persuaded was necessary to embalm the body properly This showed a general involvement of the abdominal viscera being most extensive in the liver The fœtal heart sounds ceased 4 days before the mother s death Apparently there was no involvement of the uterus. No tissue was obtained at the autopsy for microscopic sections Due to the numerous classifications at present employed in different clinics we thought best simply to use the term carcinoma and not to attempt any differentiation of type

A review of literature shows many authors expressing the belief that there is some association between mammary changes due to pregnancy and carcinoma of the breast Such a hypothesis is most natural and especially so, when one recalls the histological anatomy of the breast, with its numerous lobes lobules, and large number of acini lined with epithelium, and richly supplied with capillaries. This complex picture is made even more confusing by the marked changes especially in the epithelium, incident to the preparation for lactation In a slight deviation from normal in such a complicated transformation, one can find ready application for any of the usually accepted theories concerning the etiology of carcinoma.

It is more than probable there are additional factors other than the normal changes in the breast incident to a pregnancy, existing, and of these factors none holds a higher place in the realm of present day theory than the rôle played by any chronic irritation. We all recall a few years ago Dr Bloodgood sending to numerous pathologists slides of questionable diagnosis between chronic mastitis and malignancy The microscopical diagnoses received after such an extensive study from so many different sources varied so greatly as to convince many surgeons that there must be a close assôciation between these two conditions

In considering the causative factors of mastitis certainly pregnancy ranks high In a recent reply from Dr Walter E Sistrunk of the Mayo Clinic, he states For sometime I have felt that when a patient has carcinoma in one breast, and a definite mastitis in the other both breasts should be removed on account of the fact that I have on several occasions seen a carcinoma later develop in the breast where the mastitis was present This may be done at one operation or as a second operation according to the difficulty of the first operation

As a study of literature did not reveal a report of any effort having been made to determine the future of the remaining breast in the advent of a pregnancy in this class of case, we wrote to a number of our surgical friends and an analysis of 62 replies received showed very clearly no such postoperative "follow up has been made Forty six out of this number volunteer the information of having noticed that pregnancy apparently stimulated cancer to develop more rapidly *no matter where the growth might be located*

In this series of replies there were reported 17 cases of carcinoma of the breast associated with a pregnancy All these cases were seen late in the disease and all went to a rapid and fatal termination These cases had not been preceded by an operation and as this information was volunteered there was probably numerous other cases not mentioned

One very interesting and the most important point ascertained from these replies is found in the fact of there having been only 15 instances in which pregnancy is known to have occurred after removal of a breast for carcinoma Of this number 13, practically 87 per cent developed carcinoma in the remaining breast, 12 of whom died very promptly The interval period between operations and recurrences associated with pregnancy varied from 2 to 10 years

Dr Irvin Abell states that he has had only one case to become pregnant "and she had an induced abortion at the end of the third month—this abortion was done in the fourth year following operation now 2 years ago and the patient remains well ' This case was not listed because it is impossible to estimate what would have happened if the pregnancy had been allowed to continue Certainly the abortion was induced because of fears of the damage resulting from continuation of the pregnancy

We did not include in this estimate a case reported by R L. Payne, of a woman

having had a radical breast amputation on the right side at the age of 41 At the age of 45 her menstrual flow stopped suddenly and she reported back to Dr Payne with symptoms suggesting pregnancy and a definite lactation in the left and remaining breast There was no pregnancy present but Payne expressed the opinion that the lactation had evidently been incited by the fear of pregnancy Twelve months after lactation ceased Payne did a radical amputation of the breast which showed in the laboratory infiltrating adenocarcinoma just below the nipple in the upper quadrant This last operation was in 1910 and the patient is still living

Due to the numerous classifications at present employed in different clinics we thought best simply to use the term carcinoma and not attempt any differentiation in type

Fred L Hoffman LL D etc statistician Prudential Insurance Company of America was unable to give any data on the occurrence of cancer in the remaining breast either with or without the existence of pregnancy No further information as regards such percentages can be obtained from literature or from replies received from these 62 surgeons though as we all surmise recurrences are apparently more apt to occur in younger people than those of the sixth or seventh decade

In our 27 cases under 40 years of age who did not become pregnant there was not a case of recurrence of the cancer in the remaining breast although the recurrences elsewhere in the body where much higher in this group than in the rest of the series all of whom were over 40 years of age Of this group over 40 years of age we obtained definite information from 106—only 9 of whom or less than 10 per cent developed cancer in the remaining breast, and this in spite of the fact of our recurrences being as high as most of the recently published reports

In the reply received from James F Mitchell he reports a case having a 13 year interval and then developing carcinoma in the other breast but not associated with a pregnancy

In a review of 218 cases of carcinoma of the breast from Rochester Minnesota 10 per cent more of those over 50 years were alive from 5 to 8 years after operation than of those under 50 years suggesting there might be some ground for the rather prevalent opinion the younger the patient the more active the malignancy "

If these observations and deductions are correct we believe that surgeons should warn their patient who are in the childbearing period and from whom a carcinoma of the breast has been removed not to become pregnant for fear of serious trouble in the remaining breast

Note—Since writing the above article my attention

second breast than a normal woman of the same age in either of her two breasts To anyone interested in the subject of cancer of the breast Dr Kilgore's work will be of great interest

HYPEREMESIS GRAVIDARUM[1]

By CHARLES E. PADDOCK M D F A C S Chicago

THE use of the duodenal tube for diagnostic purposes and treatment of gastroduodenal disorders is familiar to most of us but as far as I know, the use of the tube in the treatment of hyperemesis gravidarum, excessive vomiting of pregnancy is not usual I can find no report of cases of hyperemesis gravidarum having been so treated

My attention was directed to its use in such cases by Dr Milton Portis some two years ago, and it was used at that time with marked success as will be seen in Case 1 Since then I have had but three similar cases which could not be corrected by the usual treatment for excessive vomiting of pregnancy Two of these I successfully treated by the use of the tube but the third patient refused to be so treated and continued to pull out the tube Failing in her case the uterus was emptied

It is not the intention of this paper to enter into the discussion of the etiology of hyperemesis gravidarum, numerous theories have been advanced to explain its cause and the medical literature is full of articles written upon this subject Theories are not facts and this is evident when we read the numerous theories which are assigned for the cause of hyperemesis gravidarum No sooner will one cause be given than it will be replaced with another I doubt that we are any nearer a solution of the etiology of this distressing condition than we were 10 years ago Suffice it to say we have in hyperemesis gravidarum a condition which at times baffles the most skilled clinician and occasionally leads to the death of the patient

Hyperemesis gravidarum usually occurs early in pregnancy after the seventh week and while we often find it occurring in the latter weeks of pregnancy it has occurred to me that it is not of a different etiological factor from that occurring later

The late vomiting seems to belong to that class of toxemias which are considered as pre-eclamptic and as it is one of the multiple manifestations of the toxæmias it not only calls for attention from the obstetrician but from the gynecologist from the ophthalmologist and from the internist The physiochemist and the neurologist are often consulted A recognition of this fact by any physician having a severe case of vomiting in his care may be of vital interest to his patient as well as a great source of satisfaction to himself

Nausea and vomiting in early pregnancy is frequent statistics varying from 30 to 60 per cent, and the degree varies from a mild to a very severe form There is no way to determine beforehand whether or not a patient will suffer from this distressed condition The fact that she has been exempt from it in a previous pregnancy does not necessarily mean that she will be in a succeeding one I have a patient at present who is in her third pregnancy and is suffering from very severe nausea and vomiting Preceding pregnancies have been perfectly free from either, although there are no pathological lesions which can be found to cause it

Vomiting of early pregnancy may be divided for convenience, into three stages

First there is the disagreeable nausea with slight vomiting of mucus which comes on soon after the first missed menstrual period The patient may crave food which usually is indigestible and unpalatable, rejecting other foods and able to keep down the former

The second stage is ushered in with constant nausea all food and liquids being rejected and soon the vomitus contains bile and blood The urine becomes scanty and albumin and casts appear The skin becomes dry and hot although there is little if any rise of temperature *Diacetic acid and acetone are present* This condition goes on for a week to two weeks the patient gradually becoming dehydrated the symptoms increasingly severe

The third stage is ushered in with marked acidosis perhaps less vomiting and more or

[1] Read before the Chicago Gynecological Society November 8, 1911 (For discussion see p 669)

less delirium Scanty urine with an increase of [illegible] blood [illegible] pul qu[illegible] the patient seems on a fair way to recovery food is taken and apparently the organs are

That we have no specific treatment for this excessive vomiting is evidenced by the multiplicity of drugs which have been from time to time, held up to the profession as specific only to be cast aside later as of very doubtful value As specifics we have been given ingluvin the blood of a puerperal woman or a placental extract thyroid extract and corpus luteum we have also been deluged with literature upon this subject not only from proprietary drug houses but from men who stand high in our profession Please do not misunderstand me I do not wish to say all of these agents are not useful but that they are not specific I contend

It is not so very long since we were advised to use extract of corpus luteum by mouth then to use it intramuscularly and now it must be given intravenously the latter said to be the only way to get results But why such great claims only a short time ago when given by mouth? I am always very skeptical when shown statistics furnished because of the use of specifics

Hyperemesis gravidarum in early pregnancy is rare vomiting in early pregnancy is not so rare and one must learn to differentiate the two This is why we have so many specifics The physic-element plays a very important part in the cure of vomiting of pregnancy This fact, however must not permit us to forget the possibility that a so-called physiological vomiting of pregnancy may not become through neglect in treatment a pathological one —that is a hyperemesis I do not like the term 'physiological nausea and vomiting and the sooner our textbooks omit that term the better

Every case of nausea with vomiting in pregnancy should be considered as an abnormal condition demanding the attention of the physician How often the patient is told that vomiting must be expected and that at a certain time in the pregnancy it will stop It is just such advice as this that places the life of the woman in jeopardy But recently I saw a case of vomiting carried to the limit the attending physician claiming that he had never had a case that failed to recover This one died

To terminate the pregnancy is the last resort in the treatment of hyperemesis gravidarum and unless the vomiting has been allowed to go too far beyond what we may call the danger line the result of such treatment has been miraculous From days and weeks of nausea and vomiting the patient's recovery is like magic. No sooner is the uterus emptied of the ovum than all nausea and vomiting cease. The product of conception however is sacrificed and it is because of this fact that I wish to report results by another treatment which will do away with the termination of the pregnancy in many cases

[illegible]

water for 2 weeks previous to entering hospital Tissues dehydrated and symptoms of starvation. Usual remedies used with poor result Urine scanty marked acidosis, hyaline casts The duodenal tube was passed, and after 6 hours was found to be in the duodenum Sedatives and fluid peptonized milk and cream were given in small quantities Temperature and pulse remained normal Nausea and distress continued. For some reason not explained in history sheet tube removed on the twenty fourth and passed again on the thirty first After this the patient made a satisfactory recovery Due to a justominor pelvis, a cesarean

unable to keep liquids or food on stomach for 3 weeks Patient very much depressed and had evidently lost much in weight. Her husband being a physician had used everything known in line of treatment Rectal feeding with all fluids restricted by mouth had been tried with no success Patient's skin dry

and tissues dehydrated. Patient removed to St. Luke's Hospital and on August 15 the Rehfus duodenal tube inserted The daily report taken from the history sheet is as follows

August 14, 1921 Duodenal tube passed Feeding commenced. Tube in place in 6 hours De peptonized milk water total 24 hours milk 83 ounces retained, no attempt at vomiting—slight nausea

August 17 1921 Patient doing well No emesis Fluids—corpus luteum intravenously

August 19 1921 Subjective symptoms much improved Liquids—no emesis No distress from tube

August 20 1921 An attack of hay fever lasting through the day (evidently an acute coryza)

August 21, 1921 Tube removed after 7 days, patient wearing like different person.

mptoms very

August 25 1921 Patient not so well. Complains of waves of nausea—emesis late in the day

August 27 1921 Emesis profuse Restless Rectal feeding Very much depressed.

August 29 1921 No improvement Tube passed Feeding commenced after six hours.

August 31 1921 Subjective condition much improved. No distress from tube

September 1 1921 Complains of distress and some pain over whole abdomen. Milk of magnesia in small quantities, much relief Bowels moving freely

September 3 1921 Patient removed to her home. An apparent gain in weight Tube not removed Feeding by tube continued for 1 week longer and tube removed

Patient passed out of my hands but I understand made a *fine recovery I saw her 10 days after she* left the hospital and then she was up and around Had much improved in weight and general condition good

Laboratory report The blood chemistry examinations which were made two or three times by Dr Williams gave us no information as to the severity of the case

The urine always contained traces of albumin high specific gravity and hyaline and granular casts There was no tenderness over the liver but the patient gave the picture of one very sick

This case was one upon which I would formerly not have hesitated to interrupt the pregnancy In this case I did not at first have the co-operation of the patient, and I *am* sure the husband was impatient at my optimism for the success of the treatment Much depends upon the hearty co-operation of the patient

Recently I had a similar case but if anything much nearer the danger line Starvation symptoms were much in evidence The tube was passed but the patient would repeatedly remove it I pleaded with her because of my fear that the case had progressed too far It looked like a very poor risk for an abortion She being a devout Roman Catholic gave me hope but I was compelled to empty the uterus Like magic this patient recovered

CASE 2 Mrs M primipara, married 4 years In consultation with Dr A W Woods Menstrual history normal—28 day type General health good always good. No extensive illness No operations Last menstruation March 1 1921 I saw this patient in consultation with Dr Woods June 1 She was pregnant about 3 months Vomiting was severe Patient very much emaciated Marked acidosis urine scanty High specific gravity with albumin and hyaline casts Occasional blood in the vomitus Patient appeared very sick Skin dry Pulse 100-110 Blood pressure systolic 130 diastolic 90

As Dr Woods was to leave the city the next morning he had decided to empty the uterus that day At his request I took charge of the case The tube was passed immediately The tube entered the duodenum in 4 hours and feeding commenced The success in this case was remarkable In one week the tube was removed and the next day she was taken home. No study of the chemistry of the blood had been made in this case, nor of the nitrogen partition of the urine

Here then are three cases which ordinarily would have been terminated by abortion They were all sick. The bedside picture showed them to be desperately so emaciated listless, begging to be relieved of their distress and the clinical findings showed beginning destructive organic changes These patients are alive two of them have had their babies, and the other one is about at term

As far as I know this is the first report of a case of hyperemesis gravidarum or excessive vomiting of pregnancy which has been treated by duodenal feeding and while three cases *are not enough to prove that* all cases of hyperemesis gravidarum may result as successfully I am satisfied that the tube has its place in the treatment

CHILDBIRTH

Primitive versus Modern[1]

By C H Davis MD FACS Milwaukee Wisconsin

THE geological records of prehistoric man give some idea as to how he lived We know that the sex instinct must have played an important part in his struggle for existence To what extent the early woman of our race was treated differently from the female of the higher mammals we can only guess Probably childbirth for her was not dissimilar to that of the higher apes of today But with no written word from neolithic man we must turn to the primitive peoples of our own age for study of labor among primitive races

America with its Indians negroes frontier and growing cities with emigrants from all countries gave obstetricians of the past century the unusual opportunity of being able to study the primitive in obstetric art as well as the most modern Therefore it is only natural that a St Louis obstetrician George J Englemann should have written his very interesting and instructive book on *Labor Among Primitive Peoples* To Dr Englemann book we are indebted for descriptive drawing and much of our information regarding primitive childbirth

Empirical obstetrics dates from the early centuries of man s existence and is the practice of all primitive peoples in all ages During the early centuries before races intermarried pregnancy and childbirth was a more purely physiological process than it is today and doubtless it caused woman very little discomfort Woman probably gave birth unaided and there was little regard for either foetal or maternal life in event of complications Natural law prevailed and therefore only the fittest of each generation could long survive Large families were an economic asset and early man valued his wives partially at least according to their fertility This was true in early Biblical times.

At the dawn of history intuitive obstetrical practices were probably as well developed as was possible with the complete ignorance of anatomy and physiology Sometime in the past ages the older women who had borne children began to assist the younger during the ordeal of childbirth Some of these must have possessed superior skill and they in turn instructed others in the use of varying postures massage and nauseating drinks Midwives, empirically educated were found in all of the old civilizations and semi civilizations

Judging from the earliest written records maternity has appealed to the sympathies as well as the most sacred instincts of all peoples. It is undoubtedly true as Englemann suggests that the obstetric practice of a tribe or nation is indicative of its civilization culture and morals. With the development of his intelligence man developed a religious instinct and this in turn created a new attitude toward the relation of man and woman For in *Genesis* 2 24, we read Therefore shall a man leave his father and his mother and shall cleave unto his wife and they shall be one flesh "

Empirically trained midwives had a well

the King of Egypt spake to the Hebrew midwives of which the name of one was Shiprath and the other was Puah And he said when ye do the office of a midwife to the Hebrew women and see them upon the stools if it be a son then ye shall kill him but if it be a daughter then she shall live This also indicates an early use of the obstetrical stool or chair which was an outgrowth of sitting on another person s lap during childbirth referred to in *Genesis* chapter 30 verse 3 where Rachel says and she shall bear upon my knees

Among semi-civilized peoples the priests were presumed to be the most intelligent of all men It is, therefore natural that when her empirical methods failed, the midwife

Read before the Chicago Gynecological Society November 8, 21 (For discussion, see p 686.

should turn to them for assistance At first it is probable that the priesthood gave only spiritual aid in the hope of driving out the evil spirits which interfered with the escape of a child from its mother's womb However we know that in Egypt and Greece they gave mechanical aid At a very early date cæsarean section is believed to have been performed by priests The first crude instruments for the mechanical removal of a dead fœtus were probably designed and used by them

Hippocrates (400 B C), the father of western medicine, gathered and to large degree disseminated the obstetrical knowledge of his time He established medicine as apart from religion and the physician became the one skilled in operations to remove the fœtus which could not be born During the pre anatomic epoch which followed Hippocrates obstetric practice remained in the hands of empirically trained midwives. Cephalic presentations alone were hopeful The obstetric chair was in common use and carried by the midwife from house to house Destructive obstetrical operations were taught as a branch of surgery but the physician was never called until after the death of the child

We are told that the obstetrical teachings of Hippocrates became known to the Arabs and were carried by them to the East and West His teachings penetrated to Rome shortly before the Christian era Celsus (30 B C. to 14 A.D) and Soranus (under Trojan 98 to 112 A.D) made real contributions to obstetrics Hippocrates teachings may have reached India and the Orient but it is equally probable that they developed similar ideas more or less independently The medical men in all countries probably started with the religious laws and obstetric precepts of the priesthood, and century by century as they gained some knowledge of the gross palpable anatomy of the woman tried to improve the operative measures Soranus was the first so far as we know to teach podalic version before the death of the child but when this was impossible he like the others, resorted to embryotomy ' The teachings of Soranus mark the highest development of the obstetric art in the ancient civilization of the west, fathered by Hippocrates fostered by Celsus it was perfected by Soranus with whom independent original work and progress cease for fifteen centuries (Englemann)

There has been more progress in obstetrical development during the past century than during the many thousands of years since the first of the paleolithic men roamed the European and Asiatic wilds That knowledge of this important function of woman should have developed so slowly seems strange until we recall that It was woman who gave aid to her sister in childbirth the obstetric art was in the hands of women—women of low caste it was looked upon as woman's work, and progress was thus impeded if not impossible While the aid of priests or men possessed of mystic powers was sought for in difficult cases they were at other times carefully excluded from the lying in room and thus prevented from gathering the experience necessary for progressive innovation It was eminently the sphere of women and so considered until the era of modern scientific medicine We need but recall the fate of Dr Wertt of Hamburg who in 1522 put on the dress of a woman to attend and study a case of labor and was burned alive for his pains or that of Dr Willughby one hundred years later who assisted his daughter a midwife in a difficult labor and was obliged to crawl into the darkened room on hands and knees The title of *meauti*—man grand mother—was given by the Greeks in the time of Hippocrates (400 B C) to men called in difficult cases, this spirit pervaded up to the scientific period as indicated by the appellation of man midwife given to Chamberlain the inventor of the forceps in the middle of the seventeenth century and the adherence even now of the mass of the people to the midwife of the older countries show how deep seated this feeling is During that entire era of empiricism, progress was possible only as far as the eye could reach, the important parts were concealed the mechanism only to a slight degree exposed Without means of penetrating or bringing to view the mystic process actual progress was out of the question and did not take place until the scalpel

opened the way and medical men entered upon the art in the middle of the sixteenth century (Englemann *History of Obstetrics*)

MODERN

The rediscovery of internal podalic version by Paré in 1550 was the first of the great steps in the development of scientific procedures in obstetrical practice Or should we say the application of scientific principles to the art of obstetrics? The development of

of craniotomy due to the perfection of delivery by version and forceps, and the reappearance of the induction of premature labor the discovery of the cause and nature of childbed fever by Oliver Wendell Holmes (1843) and Semmelweiss (1847) the introduction of anaesthesia by Simpson in 1847 the description of combined version by Wright of Cincinnati and a little later by Braxton Hicks of London in 1854 the application of antiseptic methods to delivery room technique in 1870 by Stadfeldt of Copenhagen and the performance of conservative cesarean section by Sanger in 1884 are the great landmarks in the growth of present obstetrical methods

Mauriceau who lived in Paris at the end of the seventeenth century is said to be the first physician who devoted himself exclusively to the study and practice of obstetrics Ambroise Paré a century earlier had been noted as a surgeon as well as an accoucheur It was not however until the middle of the eighteenth century that obstetrics was divorced from its intimate connection with surgery and also disencumbered from the trammels of ignorance, superstition and empiricism which had so greatly retarded its progress (Hodge) Smellie in England and M Levret in France greatly improved the obstetric forceps and their teachings lead to a rapid increase in the number of practitioners of this branch of medicine in their respective countries

DEVELOPMENT IN AMERICA

Among the early American obstetricians was James Lloyd a graduate of Harvard University and a student of Smellie s, who began practice in Boston in 1752 Thomas Bond and his brother Phineas Bond were early obstetricians of Philadelphia William Shippen Jr returned to Philadelphia in the spring of 1762 after studying with William Hunter and McKinzie in London and in the fall of the same year began a course of lectures upon anatomy surgery and midwifery thus laying the foundation for the first regular course of medical instruction in the United States He and John Morgan founded the Medical College of Philadelphia now the University of Pennsylvania. John V B Tennant was the first professor of obstetrics in Kings College (now Columbia) the medical department of which was started in 1767 Harvard University appears not to have had a department of obstetrics until 1815 when Walter Channing was appointed lecturer upon obstetrics and medical jurisprudence He was instrumental in America for the early popularization of anaesthesia during labor and in 1848 wrote a monograph on this subject

During the nineteenth century medical schools multiplied in every part of the United States In all of them some obstetrics was taught To William P Dewees is given the credit of first attempting a broader course of training in obstetrics, when in 1707 he gave private lectures in Philadelphia. In 1808 Wistar was appointed professor of anatomy and midwifery in the University of Pennsylvania It was due to his suggestion that in 1810 Thomas C James was appointed professor of obstetrics and the diseases of women and children but the course was not required for graduation until 1813 when the board of trustees passed the following resolution "Resolved That hereafter the professor of midwifery shall be a member of the medical

admitted hereafter as a candidate for the degree of doctor of medicine in this university unless he shall have regularly attended the lectures of the said professor for two years provided etc To Dr James therefore goes the honor of giving the first regularly recognized course of obstetrics in the United States

Samuel Bard, of New York, published the first American work on midwifery in 1808 The previous year Dewees had secured the republication in the United States of Heath's translation of Baudelocque Following this various of the European works had American editions. Bard s fourth edition was enlarged for the use of medical students in 1817, and Dewees published his splendid system of midwifery in 1825 The next American text book was *The Philadelphia Practice of Midwifery* by Charles D Meigs published in 1838 Three years later he became professor of obstetrics in Jefferson Medical College Henry Miller professor of obstetrics in the University of Louisville in 1858 published the first work on midwifery issued from the middle west This was followed by Gunning S Bedford s *System of Obstetrics* He was then professor of midwifery in the University of New York But to Hugh L Hodge in 1866 goes the honor of producing the first well illustrated obstetrics with one hundred and ten wood cuts This work appeared at the end of his teaching career and after he had become emeritus professor of obstetrics and the diseases of women and children at the University of Pennsylvania. Dewees' second edition has only eighteen cuts at the end of the text William T Lusks *Midwifery* published in 1881 and Barton Cooke Hirst s *American System of Obstetrics* published in 1888 are among the best known of the early works of the passing generation of obstetricians The later works of Hirst Webster, Cragin Edgar Williams DeLee and others are all well known to the more recent students The famous obstetricians already mentioned and their co-workers developed the specialty of obstetrics to a height in this country which is not surpassed elsewhere Our medical publications of the past century are rich in their contributions but today paradoxical as it may seem the United States, of the more civilized countries has the worst as well as the best in obstetrical practice At least the investigation of Dr Meigs of the Children s Bureau indicates that of sixteen civilized countries the statistics of which have been studied we stand fourteenth in deaths from childbirth



Fig. Patient elevated for delivery [illegible]

during the last few "pains and is usually administered for the repair of the episiotomy With this hip elevation and technique it is not necessary to shift patient for mid or low forceps and there is no difficulty in delivery of intercoming head in breech cases

In a brief paper it is obviously impossible to state even in outline all that has been done to make childbearing safer Nor can credit be given to all who have helped develop the scientific procedures now in use

Perhaps the greatest problem which confronted the early obstetricians was puerperal sepsis Prior to the observations of Holmes and Semmelweiss the history of hospital maternities is to a great extent one of childbed fever Nor were the epidemics confined to the hospital for in 1786 there was an outbreak in the plains of Lombardy from which not a single puerpera recovered Today we have ample proof from the records of many maternities that puerperal sepsis is a preventable complication The continued large number of deaths from it is certainly a strong indictment of general medical conditions. This is due in part to inadequate training of medical students but still more to the subsequent difficulties of maintaining technique when the physician tries to do obstetrics in competition with the local midwife working under similar conditions without means of maintaining asepsis or properly handling complications Hospitalization is the only solution

Craniotomy the most repulsive of surgical procedures while perhaps the oldest of obstetrical operations is today rarely performed

DEPARTMENT OF TECHNIQUE

THE "BIPP" METHOD OF TREATMENT

BONE CAVITIES AND BONE GRAFTS

BY RUTHERFORD MORISON, M.A., D.C.L., LL.D., M.D., F.R.C.S. (Eng.), F.R.C.S. (Edin.)
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IN several addresses and papers I have drawn attention to the bipp method of treatment of war wounds, and early in 1918 I summarized all of my information in a small book entitled *Bipp Treatment of War Wounds* and published by the Oxford Press.

In all of my publications I have claimed that by this method properly applied, it is possible to close infected wounds without drainage always with impunity and frequently with the result that "healing by first intention" follows.

This is a big claim for it means that a new surgical principle has been established, viz., that if an infected wound be treated by (1) thorough operative measures and (2) suitable antiseptic methods it often need cause little more trouble than a clean one does. I do not

this treatment according to the ritual I have described. That it may be more difficult than I have appreciated is suggested by my experience with junior colleagues at the War Pensions Hospital, all good and enthusiastic surgeons (Mr. Cuff, Mr. Russell and Mr. Irwin). They had tried the bipp method in many cases, sometimes with excellent results but also with not infrequent failures, before I joined them. After participation in my work, they obtained as good results as my own and did not hesitate to acknowledge that the change in their methods had brought about a remarkable improvement in their cases.

It is so difficult to convince the majority of surgeons that their outlook may be wrong that the strongest possible evidence to this effect is necessary, and it has to be offered over and over again before it has any chance of gaining acceptance. Bacteriology has done so much for surgery that surgeons are for the present obsessed by it and most of them will listen to nothing except it be fully supported by bacteriologists of repute. It will be many years yet before infected wounds are sufficiently understood to be satisfactorily treated on strictly scientific lines and though that ought to be the ideal of every surgeon he should not shut his eyes to the fact that it is so far an unattainable one and, by refusing to accept proofs that some surgical progress may still be made by clinical experiments, retard surgical advance. Patients occasionally consult me because they have heard that I have found a salve which heals wounds very quickly and even doctors sometimes appear to think in a similar way. Nothing could be further from the truth. The whole method demands attention to the principle and every detail of it. The salve *may* be the least important portion though for the present I do not think so having found nothing equally efficient.

When I recall the condition of my wards at the Northumberland War Hospital with 80 beds under the care of a house surgeon and myself I am still overwhelmed when I remember the wave of enthusiasm I felt when the dreadful conditions existing then could be said to have been brought to a conclusion. We soon found in our first year that any interference with these painful infected wounds, except to keep them as clean as possible, did more harm than good and surgery eventually had to be limited to drainage and frequent painful dressings. All the nurses and orderlies were overworked and the dressings required so much of their time and attention that there was little chance of their being able to do much for the patients outside of these performances. My own feeling then was one of desperation, because so little could be done.

As a contrast to this I will mention our experience during the last year when Dr. Pirrie

An address given to the Northern Division of War Pensions Surgeons on April 18, 1918, and demonstrations at the meeting of the British Medical Association, on July 30, 1918. Published by leave of Colonel Gorst, War Pensions Hospital, Newcastle-upon-Tyne.

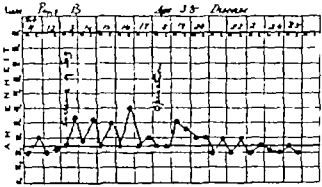


Chart 1 Case 1 showing temperature curve.

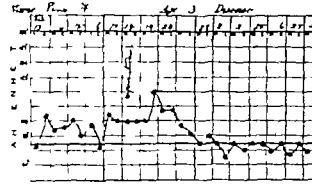


Chart 2 Case 2 showing temperature curve.

and I had almost three times the number of beds (200) under our charge. Every serious wound was treated by operation and the 'bipp' method and the consequence was that all dressings except the minor ones were done in the operating theater by Dr Pirrie and myself on one or two mornings of the week, nurses and orderlies were freed from this work to attend to the wants of the patients, and no member of the staff was overworked The change in the whole aspect of the wards was more remarkable still Instead of being filled with an ill, complaining crowd of patients they were full of cheerful men, whose chief anxiety seemed to be to know when they could get up

Though the "bipp' method has not so many opportunities of proving its value now it has still many uses both in civilian and military service.

During the last years of the War Mr Richardson tested it in the Royal Victoria Infirmary by treating a series of compound fractures by 'bipp' then fixing them with Lane's plates, with extraordinarily good results which I hope may be published

My own War Hospital results with fractures without plates were also surprisingly good, for the majority, after we had learned how to treat them were no more trouble after operation than simple fractures are.

The advantages of the bipp method of treatment were also emphasized by our results in cases of bone necrosis following gunshot wounds. Before adopting this method wounds, following necrosis operations, were left widely open for drainage, but in spite of taking all the precautions known to us, septic 'flares up" and more necrosis frequently followed our operations. I recall especially the case of a young soldier with necrosis of his femur following a gunshot fracture, on whom I operated four times for the removal of sequestra. Each of the first three operations was followed by an acute flare up and further necrosis of the bone exposed and damaged by the operation. On the fourth occasion the bipp method was adopted, and the wound closed by sutures, promptly healed without trouble.

The first cases I have to show you are men who had large acute abscesses opened, bipped,' and closed by sutures.

On admission January 12 1921 he was very ill with

3 inches.

February 18 1921 Operation. Five-inch incision between tibialis anticus and extensor communis digitorum Abscess found extending down to interosseous membrane It was lined by a thick pyogenic membrane. About 1 ounce of pus was evacuated. Abscess cavity treated with "bipp technique Skin sutured with interrupted sutures of silkworm gut. Dry dressing Boric powder on skin. No splints.

Bacteriological report on pus from abscess Staphylococcus aureus present.

February 21 1921 Dressed first time (9 days later)

perinephric abscess.

Summary Acute abscess holding 1 ounce of pus opened, bipped," and closed by sutures Healed in 15 days.

Though this abscess did not heal by first intention, all the symptoms, including the rise in temperature, disappeared immediately after



Fig 8 Roentgenogram Case 9 taken October 4, 1930 showing condition before operation

Fig 9 Roentgenogram Case 9, taken January 11 1931 3rd day after operation

Fig 10 Roentgenogram Case 9 taken June 20 1931 165 days after operation

bottom and healing is much delayed though the grafts have never in our experience been extruded

After months of daily dressing and discharging these cases may be expected to heal in a few weeks It is interesting to watch in X ray pictures replacement of the fat by bone

tween then and now is that years instead of months have elapsed since the wound and fracture which resulted in a bone cavity the patients are not so physically fit and are more often in a hopeless frame of mind after undergoing a series of operations which have failed to cure them It was impossible for me to offer statistics from the Northumberland War Hospital in support of my views, because the patients were kept there for as short a time as possible and after leaving hospital many of them could not be traced Possibly for this reason so little importance has been attached to my work that in the latest book on the *Orthopedic Surgery of Injuries* edited by Sir Robert Jones and published this year Mr Elmslie who has written the article on bone cavities, excellent in every respect except in the treatment of them never mentions fat grafts though he approves of the Lipp" method of treatment of the cavity [1] Where the cavity cannot be obliterated by flattening out its walls, he uses a muscle graft and *drains*

For any cavity which can be made shallow enough without seriously weakening the bone all are agreed that this method is best but in the most serious cases nothing short of filling the cavity with some sort of graft will suffice. In the great majority of my cases multiple fat grafts have been used in some muscle and fat in others muscle alone I have not used muscle which could perform its proper function for this purpose.

Since working at the War Pensions Hospital I have been able to follow up all of my cases and am now able to say definitely that there has been no failure and that no bone cavity has been discharged from our supervision until healed and after a test of 10 days exposure to radiant heat has proved that it is unlikely to break down again

Omitting any reference to the minor cases cured by the removal of sequestra chiseling

[1] At the British Medical Demonstration in July 1931 Mr Elmslie stated that his article was written before my book was published

away the walls, application of bipp ' and immediate closure by interrupted sutures, I have note
last year
by grafts.
dates back as far as 1914 and all of them had undergone multiple operations which had failed to cure the discharging sinus for which they were admitted

The fact may be recognized that radical operation in these cases may be a difficult and prolonged one and it always requires patient, persistent perseverance. A large incision is essential to allow of proper access and it is important to remove sufficient of the sclerosed bone covering the cavity to *see* every part of it. The most difficult cases are those in which the entire bone has been perforated by the missile. A striking example of this occurred to me in the femur There was a long discharging sinus on the front of the thigh in the center of a large scar, and there was a *healed* scar opposite to this on the *back* of the thigh. A sequestrum was removed from a pocket in the *back* of the thigh bone after 2 hours hard work. It is very easy to miss a sequestrum lying either in the bone or soft parts on the side opposite to the discharging sinus and nearer to the healed scar

A skilled assistant should take out every particle of bone as it is separated, otherwise healing of the wound may be delayed until it is taken out or extruded. When possible the operation should be done with a tourniquet to allow of satisfactory inspection and to prevent the serious loss of blood which may follow one hour or more of operating If there is any doubt felt as to *seeing* the whole cavity, aided by a bull s eye light, I pack it with 'bipped gauze, close the incision by interrupted sutures over this and at the end of 2 weeks dress the wound, take out the sutures, reopen it, remove the gauze fill the cavity with fat grafts and resuture, if there is no sign of wound infection.

The fat I prefer is taken from the outer side of the thigh and overlying the fascia lata It is more fibrous and less greasy than that from the abdominal wall.

There must still be hundreds of men incapacitated by chronic bone sinuses and the proper treatment of them is a matter of importance to the country Their health and working capacity are undergoing gradual deterioration and many of them become seriously ill from flares up' from time to time. This is my reason for placing such great emphasis upon the subject in this address.

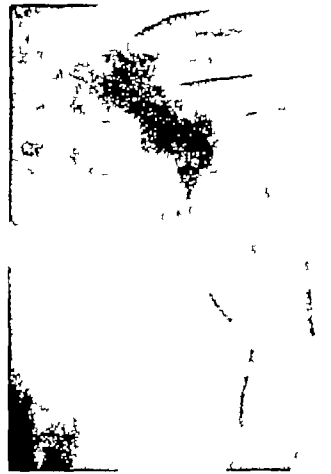


Fig 11 Roentgenogram Case 10 taken September 29 1920 before operation

Case 4. Pens L. age 33 Gunshot wound left leg Fractured tibia Wounded August 26 1918 by a machine-gun bullet when going over the top Bullet went through both legs. He lay for 4 days before being picked up—got caught in barbed wire when crawling in The right leg healed at once—bullet went through without touching bone Four operations had been done on left leg before admission.

On admission May 6 1920 there was a scar on outer and inner aspect middle of left leg Some discharge from inner wound. X ray showed large cavity in tibia with sequestrum.

May 29 1920 Operation. Mr Cuff. Scar and sinus excised by 4-inch incision. Edges of cavity rounded off with chisel. Small sequestrum (size of pea) removed. Cavity scraped with spoon, bipped," and wound closed with bipped silk.

was cut on outer surface of wound and pulled over cavity and secured *in situ* with bipped silk.

July 13 1920. Dressed first time—21 days after operation Good deal of discharge. Fat exposed Looking well —no pus

September 6, 1920 Fat still exposed. Wound now dry

October 6 1920 Wound still dry—diminishing in size. Fat showing a before



Fig. 12. Roentgenogram Case 11 before operation.

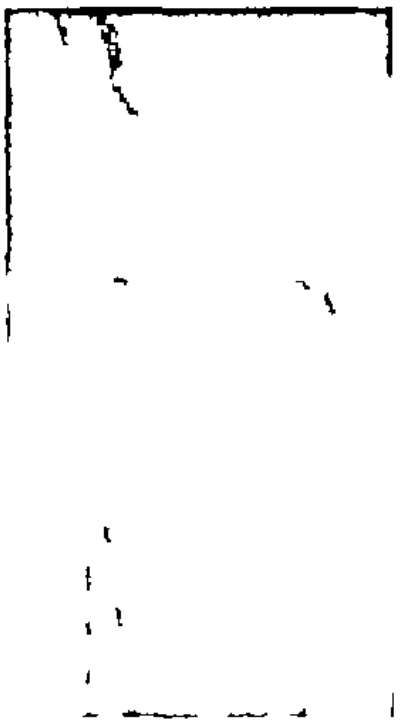


Fig. 13. Roentgenogram Case 11 taken April 4, 1921, 52 days after operation.

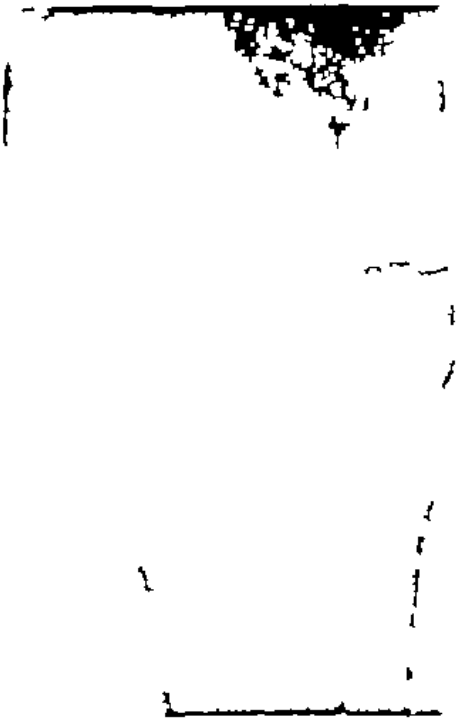


Fig. 14. Roentgenogram Case 11 taken July 1, 1921, 150 days after operation.

December 6, 1920. Patient living and discharged at bottom of gap.

January 6, 1921. Now an elliptical granulating wound inch long by ½ inch wide at lower end of incision. Fat still exposed at bottom of it. Closing in.

February 7, 1921. Fat still showing.

March 7, 1921. Fat now covered by granulations. Dressed lapp.

March 21, 1921. Closing in quickly.

April 8, 1921. Healed.

June 3, 1921. Finished radiant heat treatment. Sound-ly healed.

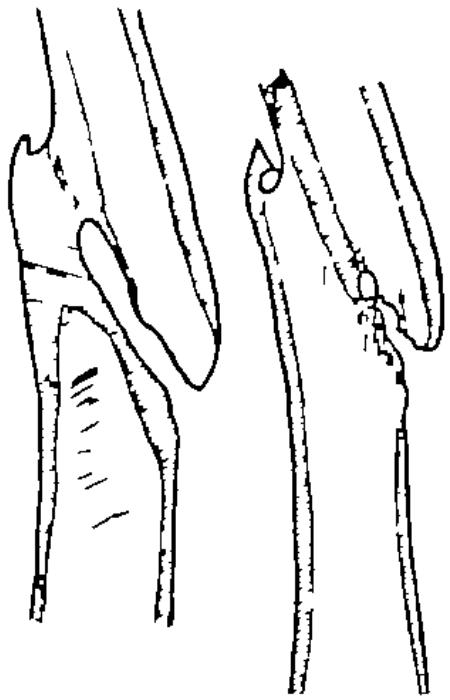


Fig. 15 (at left). Condition, Case 1, before operation.
Fig. 16. Condition, Case 2, after operation.

September 7, 1916, by shrapnel. The wound was healed from November 19, 7 until January, 1918, when it broke down again. Since then he has had 10 operations—

July 4, 1920. Returned to Central Hospital for further treatment. Diseased bone.

September 19, 1919. Operation. Large cavity in lower end of femur opened up. Sequestrectomy. Sutured.

November 18, 1919. Discharges offensive and purulent. X-ray showed more sequestra.

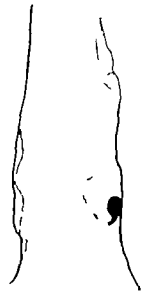


Fig. 17 Condition, Case 13 before operation

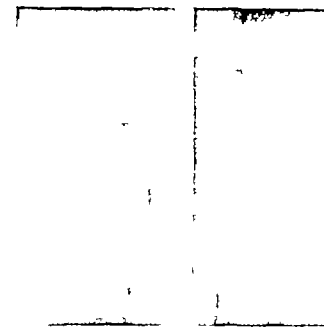


Fig 18 (at left) Roentgenogram, Case 14 taken November 17 1920 before operation.

Fig. 19. Case 15 taken November 17 1920 before operation

November 21 1921 "Bipp" and olive oil in equal parts
January 29, 1920. For operation. Transferred
May 1920. Operation sequestrectomy
June 15 1920. Operation. Professor Morison. Scar and sinus on outer aspect lower third of left thigh excised. Muscles incised down to bone and retracted. Cloaca enlarged with gouge and larger gutter cavity (4 inches) exposed. This was cleaned out with gouge and spoon, and dry gauze, swabbed with spirit, and "bipped" The incision was carried up for another 3 inches and four plugs of subcutaneous fat cut, and cavity filled with same The [illegible] bipped [illegible].
July 2, 1920 Dressed first time Not healed. Flap dusky Not much discharge.
July 16 1920 Flap sloughed and fat exposed.
October 22 1920. Still a large unhealed area where skin flap sloughed and a good deal of discharge. Dressed flavine.
November 6, 1920 Much less discharge. Wound probed —bare bone could *not* be felt No fat had ever come out
January 10, 1921 Little pus coming from surface apparently at lower end of wound. Rest of wound healed
January 31 1921 Still a good deal of pus could be squeezed up from under skin at lower end of wound
February 14, 1921 Lower end of wound opened up of wound
March 7 1921 Very nearly healed. Hardly any discharge on 3 days dressing
March 21 1921 Healed. For radiant heat treatment.
April 4, 1921 Finished radiant heat treatment. Soundly healed. For discharge

Summary Pens. W age 21 Wounded September 7 1916. Large bone cavity in femur Many previous operations—more than ten. Last operation July 2 1920 (Professor Morison)—cavity filled with fat graft. Skin flap sloughed Healed March 21 1921—8 months.

Case 6. Pens. J. E. S., age 21 Gun shot wound right thigh with fractured femur Bullet in liver Wounded October 9 1918 by a machine-gun bullet when going over the top A bullet was removed from his liver at a C C S Has had 10 operations on femur X ray shows cavity in femur

Note from English Hospital October 23 1919 "Patient wearing caliper splint ½ inch extra sole to boot. Long linear scar along lateral surface of right femur Healed except for persistent sinus in middle of scar Complete ankylosis of knee joint. X ray shows old fracture of femur with cavity in bone and sequestrum.

August 31 1920 Operation by Professor Morison Tourniquet used. Longitudinal incision 12 inches in length with sinuses in middle part of it. Cavity in bone exposed and a considerable amount of unhealthy granulation tissue found lying in lowermost part of medulla. Cloaca enlarged and all overlying bone tissue removed Sclerotic tissue chiseled away Several tracks in bone opened up. The bone cavity was found to open on to popliteal surface of femur A large graft of the vastus externus muscle was placed in the cavity after the latter had been cleaned by "bipp" technique Tourniquet removed Wounds sutured with catgut. Bipped silk for skin Put up in plaster-of-Paris

September 1 1920. Discharge through twice in night [illegible]

dressing

September 13 1921 Being dressed daily Little serum. Looking well—wound not opening up Patient out on balcony

October 1 1920 Patient complained of abdominal pain temperature 101 6°

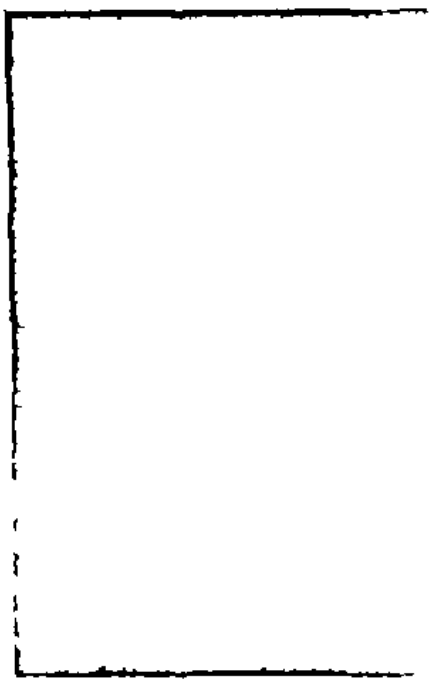


Fig 20 Roentgenogram, Case 6 taken November 9, 1920, before operation



Fig 21 Roentgenogram Case 16, taken April 12 1921 68 days after operation.



Fig 2 Roentgenogram, Case 16 taken April 12 1921 68 days after operation.

Opening ⅝ inch by ⅜ inch in center of wound of oval shape with sinus in middle of it, from which there had been

T be

October 30 920 Healed
December 3 920 Has had 14 days radiant heat treatment Soundly healed
Summary Pens J E S age Wounded October 0 0 8. Fractured femur Large ca ty 0 previous operations Last operation (Professor Morrison) August 3 920 Healed October 30 920—2 months
Case 7 Pens G age 23 Gunshot wound left thigh

T

tween undermined to allow closure over gauze in cavity without tension. Sutured with "lapped silk I dees of tension incision on each side sutured with lapped silk to muscle fascia to diminish raw surface Bridge of skin sored Dressed strips of oiled silk and dry gauze Small under sinus lapped
October 15 1920 Second operation Professor Morrison Wound, which was healed opened up, and gauze pack

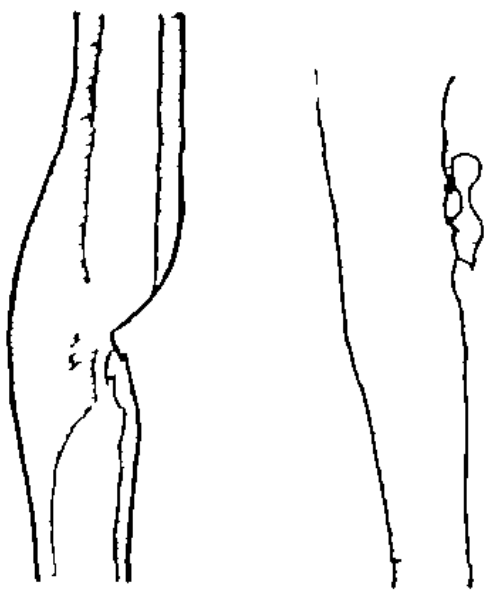


Fig 23 (at left) Drawing, Case 17 showing condition before operation
Fig 28. Drawing showing condition in Case 20 before operation



Fig 24 (at left) Roentgenogram Case 18, taken March 15 1921 before operation.
Fig. 25 Roentgenogram, Case 18, taken July 12 1921 103 days after operation.

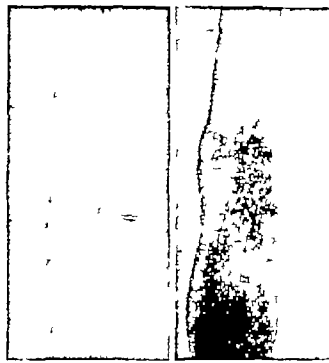


Fig 26 (at left) Roentgenogram Case 19 taken March 29, 1921 before operation.
Fig. 2 Same as Fig 26

removed with difficulty, as the gauze was infiltrated by granulation tissue, cavity was scraped out gently with a sharp spoon. No sign of sepsis present. Cavity was cleaned with spirit and "bipped." Incision about 8 inches long was made on right thigh and 4 pieces of fat overlying fascia lata removed from this and placed in cavity in left

[illegible]

grafts. November 6 1920. First dressing (3 weeks) Wound over cavity healed by first intention, but broke down in center later (December 4 1920) February 14, 1921 soundly healed—4 months.

CASE 8. Pens. T S., age 25. Gunshot wound left leg Wounded October 4 1918 by a bullet, near St Quentin Has had 7 operations—the most recent on September 2 1920. Never healed.

Admr C C S October [illegible] 8. Entrance wound about of leg (fracture) leg swollen and

October 7 1918. First operation. P drain Wound

[illegible]

December 6 1920 Abscess burst. A very little blood-stained pus evacuated. Bipp" dressing.
December 8 1920 Still a few drops of discharge (pus mixed with "bipp")
December 13 1920 Appears to be soundly healed.
January 24, 1921 Small discharging sinus in middle of scar over bone cavity—*where abscess formed and opened.*
February 7 1921 No discharge but not quite soundly healed. Flavine.
February 14 1921 Healed. To have radiant heat treatment.
March 14 1921 Has had radiant heat treatment for a month. Soundly healed—never broke down under it.

Summary Pens C age 23 Wounded April 27 1915. Fractured femur Large cavity 6 previous operations—never healed. Final operations (Professor Morison) First stage September 16 1920 cavity cleaned with "bipp" technique second stage, October 15 1920 wound healed over "bipped" gauze Opened up Cavity filled with fat

partial destruction of middle of shaft of tibia."
October 30 1920 Patient greatly improved. Wound has been doing well on Carrel Dakin treatment but there seems to be a pocket of pus anteriorly to be opened up soon
November 7 1918. Second operation Wound completely opened up and extended
December 5 1918 Third operation Opening over cedematous area below knee. Pus evacuated and several pieces of dead bone removed from a round area. Carrel Dakin treatment
December 14, 1918 Fourth operation Abscess opened and pus evacuated
December 27 1918 Wounds clean and healing slowly
May 25, 1919. Scotch Hospital Small wound middle of shaft of tibia Complete fracture of same wound not dry ¾ inch shortening
June 26 1919. Fifth operation Sequestrectomy Attempt to close cavity Sinus excised and bone cavity

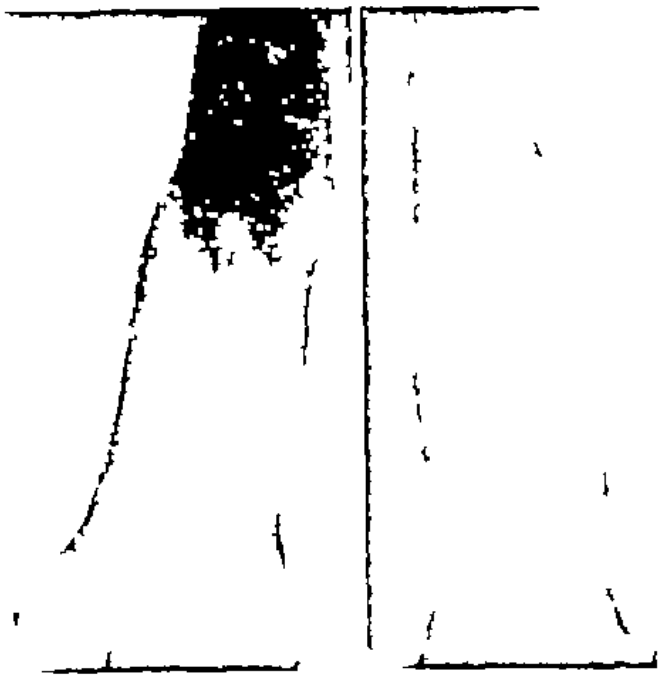


Fig 29 (1 left) Roentgenogram Case 21 before operation

Fig 30 Roentgenogram Case 1 49 days after operation



Fig 31 Drawing showing condition in Case 22

cleared of sequestra (2 present) Ca ty scraped incised Pure carbolic Soft part sewn across

July 10 9 0 Wound broke down rather badly—now healing nicely

August 20 9 0 Massage N nerve lesion Bone union firm Still scabbing at wounds

September 1, 9 Anterior tibial nerve interfered with by scar Sinu over tibia N bare bone felt

November 5 1919 8th operation Turning scar down to tibia Indolent granulations and sequestra removed from tibia and overhanging edges f bone chiseled away Healthy bone tissue and skin approved without tension

November 20 19 6 Skin in poor condition, retracted from wound

War Pensions Hospital N C September 1 1920 Raw area about size of a shilling on middle of anterior surface of left leg discharging pu Sinus—probe goes about inch into tibia

September 1920 Seventh operation Sinu excised

Same procedure followed with lateral counter incision Ca ty and fat graft covered by two skin flaps attached at both ends Skin of flaps scored Wound dressed with bipp dry gauze and boric powder

October 15 1920 Dressed first time—3 weeks. Very little discharge—not more than ½ dram. Middle

September 8 1920 dressed first time In lower two thirds of incision skin edges approximated. Upper two-thirds an elliptical gap inches by 1 inch The cavity was clean and lined with healthy granulation tissue Packed with bipped gauze

areas in center of scar unhealed

December 4, 1920 Wound dry Healing—two small areas less

March 7 1921 Still two very small, quite dry unhealed area

April 18, 1921 Healed

June 13 1921 Has finished radiant heat treatment Soundly healed

Summary Pens. T S age 25 Wounded October 4, 18 Last operation 1920—cavity —6½ months sinus left leg

Wounded November 10 1918, by shrapnel Has had 12 operations on his left leg, but it has never been healed

At one operation 13 pieces of metal were removed—this was in June, 1919 The same month another operation was as taken from was used and

al Newcastle.

Excision of sinus—large quantity of old bipp" scraped from large cavity in tibia Cavity cleaned out—for later operation. Patient was temporarily discharged—returned to hospital on September 27 1920 There is still a discharging sinus below the left knee and a good deal of scar tissue round it

October 8 1920 Operation. Professor Morison. Tourniquet applied Probe passed into sinus and bare bone was fel and longitu the size of

of the joint and about the size of a hen's egg The bone surrounding cavity was much sclerosed The cavity and surrounding skin were cleaned after bipp" technique The skin edges were undermined. Two longitudinal relief incisions 4 inches long were made on each side of the wound and the skin between these and the wound incisions, 2 inches wide, undermined. The whole flaps of skin between the anterior relief incision and the original incisions were turned back An incision was made on the outer surface of the left thigh and 8 large pieces of fat were removed and placed in the cavity in the tibia. The thickened periosteum which was peeled off the tibia, was sutured, over the fat to keep it in position Catgut sutures and 2 interrupted catgut sutures, with figure-of-eight. The sinus flap was sutured into position over this with lapped silk and fishing gut The skin edges of both relief incisions were sutured to the muscle fascia to secure as much closing as possible Skin scored. Boric powder Two Gooch splints. The incision on thigh was sutured with continuous suture of catgut.

October 11 1920 There was some discharge through dressings Pickled on outside with spirit, sprinkled with

castor oil

The wound on thigh has healed.

Bacteriological report on discharge Large number of colonies of staphylococcus aureus found.

November 6 1920 Second dressing. About 1 dram of pus was found on dressing. No more separation of flap The fat remained undisturbed and in position. Dressed with flavine.

November 12 1920. Third dressing About 2 drams of purulent discharge were found on dressing chiefly from tension incision wounds. Granulation tissue was a little exuberant. No fat has extruded. Cavity filled with "bipp" over exposed fat.

November 29, 1920. Cavity healing in rapidly—refilled with "bipp." Granulations on relief scars now level with skin and healing well.

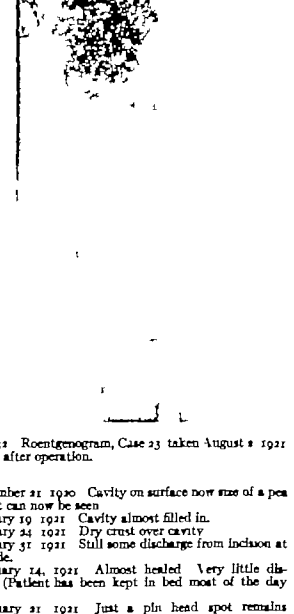


Fig. 32 Roentgenogram, Case 23 taken August 2 1921 25 days after operation.

December 21 1920 Cavity on surface now size of a pea —no fat can now be seen

January 19 1921 Cavity almost filled in.

January 24 1921 Dry crust over cavity

January 31 1921 Still some discharge from incision at inner side.

February 14, 1921 Almost healed Very little discharge. (Patient has been kept in bed most of the day lately)

February 21 1921 Just a pin head spot remains unhealed

February 25 1921 Healed

March 30, 1921 Patient sent for radiant heat treatment. All scars broke down under it. To be dressed with flavine and to be kept in bed

Bacteriological report on discharge Staphylococcus aureus present but not so numerous as on occasion of last examination

April 4 1921 Healing in rapidly "Bipp."

April 28 1921 Healed

June 13 1921 Has had radiant heat treatment again. Never broke down. Soundly healed

Summary Pens. B age 23, wounded November 10 1918 fracture of tibia. Twelve previous operations—at one fat grafts were used but no "bipp" and the fat suppurated out. Final operation for bone cavity October 8, 1920 (Professor Morison) cavity "bipped" and fat grafted Some infection of wound but insufficient to disturb exposed fat grafts.

February 25 1921 Healed

March 30 1921 Radiant heat Scars broke down

April 28, 1921 Healed—6 months.



Fig 33 Roentgenogram of jaw 6 months after fat grafting operation



Fig 34 Roentgenogram of same patient as in Figure 33, 9 months after operation.

June 3 1921 Finished radiant heat treatment Soundly healed

Case 10 Pers D., age 43 Gunshot wound right shoulder Wounded May 19 8 near Arras Has had three operations—the first in June, 918, for the removal of shrapnel the second on September 20 1918 seques-

October 1920 Operation Professor Morison The arm over the head of the humerus was everted A large cavity was found in the ankylosed head of the humerus The cavity extended a considerable distance down the

which tracked through scapula into supraspinous fossa. This cavity was cleaned and the whole wound treated with bipp technique A square-shaped skin flap was

November 12 1920 Dressed first time—3 weeks after

as before.

March 7 1920 Not quite healed—a very little discharge

April 4, 1921 A probe dipped in pure carbolic acid was passed right through both sinuses No bone was felt.

To be

1918

Large bone cavity in upper end of ankylosed humerus, cured by muscle grafts The case is shown specially to illustrate the difficulty of treating shoulder wounds, and partly because this patient is the only one we have had here showing bipp poisoning in the first degree. Oper

tions. At one of these fat grafts were employed but no

September 3, 1920 Acute lymphangitis of thigh developed and operation was therefore postponed

poisoning

leg

September 2 bone cavity microscopic st report. A few diph- mber of staphylococci found.

November 2 1920 Operation Professor Morison Tourniquet applied. A semilunar incision with convexity lying medially was made The sinus was excised and the whole wound treated with bipp technique. The cloaca was enlarged and very vascular bone removed also two metallic bodies. Tourniquet removed "Bipp Cavity with silkworm gut.

Bacteriological report on discharge (taken before com- grafts were Healing in



Fig 35 (at left) Photograph of Case 24, 1 year and 5 months after operation

Fig. 36 Roentgenogram Case 24 1 year and 5 months after operation

shortening of that bone The bullet passed right through the thigh and since that date the anterior (entrance) wound has never been sound—occasionally healing for a few weeks and then breaking down and discharging co-

over the exposed fat.

December 20 1920. Operation Flap cut with pedicle above and drawn over the exposed fat and sutured in position Tension incisions were made and the exposed area brought together as closely as possible with catgut sutures.

December 27 1920 Patient thought the bandage had slipped, so dressing was changed. The flap had given a little at the upper end—an area the size of a little finger nail. The whole flap was living and looking well. Re-bipped

January 10 1921 Wound is being dressed every second day There is little discharge. Wound is granulating satisfactorily To be dressed once a week.

January 31 1921 Still a little serum (one drop) at upper and outer angle of flap Bipp." To be allowed up on crutches.

February 7 1921 There is still a very little serum on the dressing.

March 14, 1921 Wound very nearly healed

June 13 1921 Wound not healed yet Nothing could be felt with probe To be probed when dressed (once weekly) with pure carbolic.

July 18 1921 Wound not yet healed. Very little discharge.

Summary Penn B., age 43 Wounded June 2 1915 Fractured tibia. Six operations since Fat graft used at one of them but no bipp" and fat suppurated out Final operation for bone cavity November 2 1920 (Professor Morison) Skin flap partially sloughed exposing fat. Still not quite healed Area of dermatitis This man's skin is intolerant of iodoform or flavine

Case 12 Penn C age 29. Gunshot wound of right thigh. Wounded April 6 1918 by shrapnel. The right femur was fractured and in consequence there is 2-inch posterior wound was healed

probe was ex periosteum walnut The ex deavored to broaden out the hole in order to make as shallow a gutter as possible It was impossible to use a tourniquet as the lesion was so high up on the thigh.

catchment through to the back of the thigh, was plugged with fat. A muscle and scar pedicled flap was sutured down to fill the cavity The vasti muscles were sutured over this with figure-of-eight suture of thick catgut. The skin was closed with Bipped" silk suture. No splints were applied.

and lower end had cut in a little The sutures were removed. "Bipp" Boric powder

Bacteriological report Staphylococcus present in speci men.

January 6 1921 Returned from Christmas leave Unhealed superficial small area in center of scar still discharging slightly Flavine.

January 31 1921 One drop of discharge. The granulating area is now the size of a pin head.

February 14, 1921 Still an unhealed area present in center of scar To have radiant heat through his dressings, but to report at once if the wound flares up

March 14, 1921 Still one very small superficial ab

July 18, 921 Still a small sinus, which is filling in from the bottom

Summary Fractured fe tion for bo Monson down again

cavity or sequestrum was palpable

November 19, 1920 Bacteriological report on pus from wound *before* operation Gram negative bacilli present. Bacillus coli No staphylococcus nor streptococcus found

November 19, 1920 Operation Professor Monson The cavity in the femur was exposed and enlarged A small perforation passing backward through the bone was enlarged and 3 sequestra removed The cavity where the

in 3 weeks

January 24 192 Finished radiant heat treatment Soundly healed For discharge.

Summary Wounded December 8, 916 Fractured femur Twel e previous operations. Last operation November 9 920 Professor Monson.

January 6 921 returned from Christmas leave all

healed and broken down—never healed for more than 3 weeks at a time In June 920 the arm ached and swelled and an acute abscess formed He has had 8 operations

July 8, 1920. X-ray shows old fracture humerus—possible cavity

November 19 1920. Operation Professor Monson. A discharging sinus over upper end of humerus was excised. The upper end of the humerus was exposed There was a sinus communicating with the medullary canal The sclerosed anterior wall of the bone was removed

was treated with Bipp technique. Interrupted

sugar per rectum.

November 23, 1920. Patient feeling very comfortable Temperature normal Color good

December 10 1920 Dressed first time since operation—3 weeks

About ½ dram of moisture on dressing (apparently paraffin and bipp") One of the sutures at about the middle of the wound had cut in a little. The sutures were removed. One small granulating area was present at bottom of wound—rest healed. Bipp " For daily dressing

December 14 1920 Healed. To be allowed home for holidays and to return (if all is well) on January 5, for 10 days' radiant heat treatment.

January 5 1921 Returned soundly healed For radiant heat.

January 14, 1921 Finished radiant heat treatment.

1920—25 days

CASE 15 Officer X., age 26. Gunshot wound left thigh Wounded August 13, 1918, by a machine gun bullet, when flying The wound healed several times, but

thigh

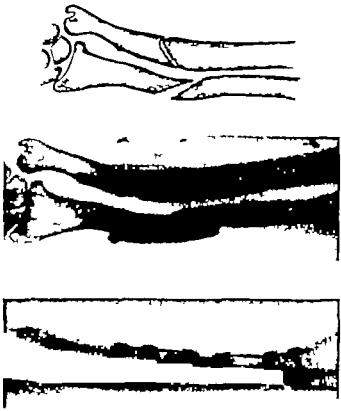
November 26 1920 Operation A curved incision 8

December 18 1920 First dressing—3 weeks after operation

The dressing was perfectly dry except for one spot of granulation tissue about the size of a split pea. This area was in the center of the wound The whole of the rest of the operation incision was healed by first intention

December 20, 1920 Healed

January 20 1921 Has had radiant heat treatment for 3 weeks and remains soundly healed.



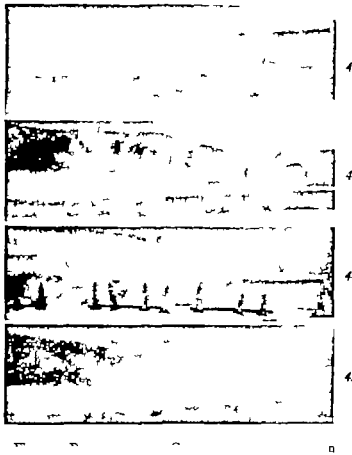


Fig 37 Drawing showing condition in Case 25 before bone-grafting operation

Fig. 38 Roentgenogram Case 25 16 months after plating operation.

Fig 39 Case 26 79 days after operation.

Fig 42 Roentgenogram Case 27 139 days after operation.

Fig 43 Roentgenogram, Case 27 6 months after operation

Summary Capt. A., age 26 wounded August 13 1918. Fractured femur Ten operations have been done since and have failed to secure healing of sinus in thigh

November 26 1920 Operation for bone cavity Fat grafts. Professor Morison.

December 20 1920 Wound entirely healed—24 days.

CASE 16. Pens. M., age 28. Gunshot wound right knee. Wounded July 1 1916 on the Somme. Three operations before admission

February 27 1920 A depressed scar is adherent to the bone over the external condyle of the femur The knee is

charging sinuses were present in the incision line on the inner side of the joint.

November 12 1920. Fifth operation. The old wound had been opened up over the sinuses and two small sequestra were removed.

February 1 1920 Still discharging sinuses were present —never healed since last operation.

February 3 1921 Sixth operation. Professor Morison. A cruciate incision and the site of ankylosis explored.

February 10 1921

3 times and dressings

a little at lower end of

apparently dry and cx

February 14 1921

February 27 1921

March 7 1921 To wear a plaster bandage on knee

Summary Wounded July 1 1916 in Knee (right) Five operations previous to fat grafting. Last operation February 3, 1921 (Professor Morison) Healed February 27 1921—24 days.

CASE 17 Pens B., age 28 Gunshot wound of right femur Wounded by an explosive bullet in the right thigh on September 26 1915 The femur was fractured. He was treated on a Thomas splint for 6 months. Since that date he had never been absolutely healed, there had always been a discharge from a sinus There had been numerous acute "flares" and abscesses had been incised in different places Many pieces of bone had come out through the sinuses.

was opened up, was scraped and

February 14, 1921 Still an unhealed area present in center of scar To have radiant heat through his dressings, but to report at once if the wound "flares up

March 14, 1921 Still one very small superficial dis-

July 18, 1921 Still a small sinus, which is filling in from the bottom.

Summary [illegible]
Fractured fe
tion for br
M nurse
down again

The cavity in the femur was exposed and enlarged A small perforation passing backward through the bone was enlarged and 3 sequestra removed The cavity where the

in 3 week

December 10 920 Dressed first time—21 days. Two

Soundly healed I r radiant heat

January 24, 9 1 I mished radiant heat treatment Soundly healed For discharge.

Summary Wounded December 8, 1916 Fractured femur Twel e previous operations. Last operation November 19, 1920 Professor Morison

January 6 921 returned from Christmas leave all

healed and broken down—never healed for more than 3 weeks at a time In June 920 the arm ached and swelled and an acute abscess f rmed He has had 8 operations

July 8, 1920 X ray shows old fracture humerus—possible cavity

November 19, 1920. Operation. Professor Morison. A discharging sinus over upper end of humerus was sucked. The upper end of the humerus was exposed. There was a sinus communicating with the medullary canal The sclerosed anterior wall of the bone was removed f

mto the lower cavity and sutured there. The whole surface was treated with "Bipp" technique. Interrupted

sugar per rectum

November 23, 1920 Patient feeling very comfortable Temperature normal. Color good

December 10, 1920 Dressed first time since operation—3 weeks.

About ¾ dram of moisture on dressing (apparently paraffin and "bipp") One of the sutures at about the middle of the wound had cut in a little. The sutures were removed. One small granulating area was present at bottom of wound—rest healed. "Bipp." For daily dressing

December 14 1920. Healed. To be allowed home for holidays and to return (if all is well) on January 5 for 10 days radiant heat treatment.

January 5 1921 Returned soundly healed. For radiant heat.

January 14, 1921 Finished radiant heat treatment.

1920—25 da)

CASE 15 Officer X age 26. Gunshot wound left thigh Wounded August 13 1918 by a machine gun bullet, when flying. The wound healed several times, but

thigh

November 26, 1920 Operation. X curved incision 8 inches long exposing sinus, was made The fibrous tissue was excised the bone exposed, and the periosteum peeled off X small sequestrum found lying in cavity on posterior surface of bone was removed. The whole area treated

sutures.

December 18, 1920 First dressing—3 weeks after operation.

The dressing was perfectly dry except for one spot of

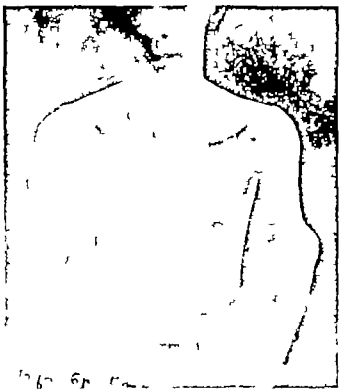


Fig 48 Photograph of patient before operation. Case 29

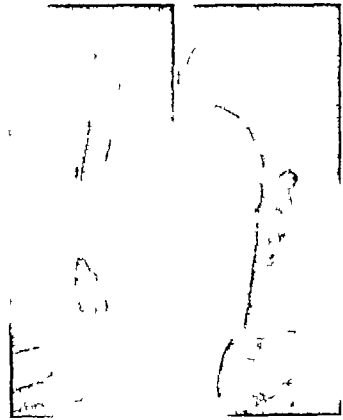


Fig. 49 (at left) Roentgenogram, Case 29 before operation.

Fig 50. Roentgenogram of arm, Case 29 85 days after operation.

the femur which was felt to be bare. A 6-inch incision was made down to bone. Four large sequestra were felt and removed from a cavity deep on the inner and posterior part of the bone lined with soft septic granulations These were taken away and the area cleaned bipp technique. A separate incision was then made on the outer side of the same thigh and fat taken out. Six small pieces were introduced into the prepared area. The muscles were drawn across with catgut and the skin edges approximated with silkworm-gut, entirely closing the wound.

April 18, 1921 Dressed *first time*—10 days *Quite dry* and apparently healed.

April 24 1921 Sutures removed. A little serous dis-

felt near the back of the bone. After considerable trouble it was removed, by manipulation through the back and front, from the anterior sinus. The sclerosed bone was chiseled out of cavity as much as possible Eight fat

1921 Last operation for bone cavity Professor Morison, April 18, 1921 Healed—10 days. Some serum escaped since sutures were removed. May 2 1921 Soundly healed—24 days

CASE 21 Pens D age 25 Gunshot wound of right thigh. Wounded September 18 1916 Fractured femur Persistent sinus following gunshot wound on front of thigh. The wound has healed periodically—never for more than 5 weeks at a time, and when healed the leg was always painful and swollen. Seven previous operations. One and one-half inches shortening of leg.

X ray shows shadow—? sequestrum,—and cavity in much thickened femur

April 29 1921 Operation. Professor Morison. Bone cavity opened up from front. A sinus was found to pass down through the cavity of the femur to the posterior aspect of that bone. A second incision was made at right angles to the lower end of first The vastus externus was divided and the femur fully exposed. A sequestrum was

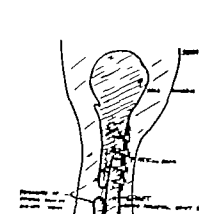


Fig. 51 Diagram of bone graft of humerus, Case 29.



Fig 52 Roentgenogram, Case 30, before operation, May 5 1920 Showing irregular upper fragment lower fragment squared off.

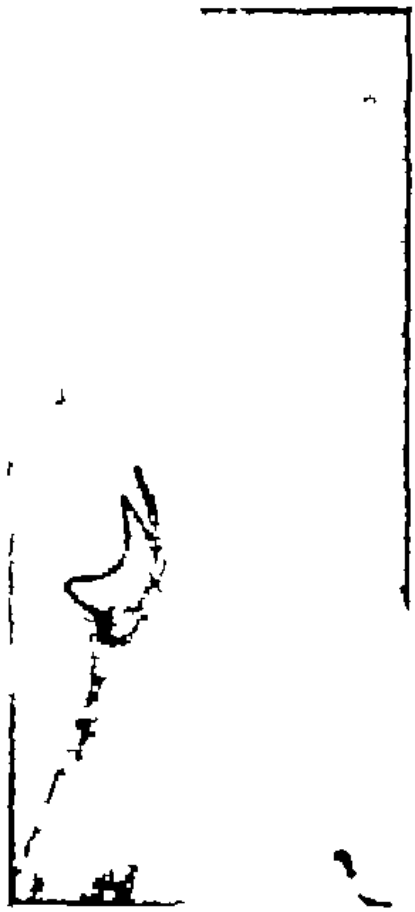


Fig 53. Roentgenogram Case 30 January 4, 1921 before Professor Morison's operation



Fig 55 Roentgenogram, Case 30 79 days after operation, April 24 1921

May 1921 Dressed for first time on account of

May 11 1921 Operation Mr Irwin Longitudinal

May 21 1921 Dressed No pus discharge—small

before—no bone felt

July 8, 9 Almost healed No bone felt

Summary Pens D age 5 wounded September 18, 1916 in right thigh Fractured femur Persistent sinus—

The wound looked perfect and was free from any inflammation

June 10, 1921 Small piece of loose bone felt in sinus—could not be removed

healed (4 weeks after operation)

CASE 23 Pens C age 26 wounded November 17 1917 Fractured humerus Six previous operations. Never healed

healed since discharge was 3 months He has had 11 operations, efforts to heal the wound

July 8, 1921 Operation Professor Morison The greater part of the scar and sinus were excised by an

elliptical incision. The periosteum was peeled off and the bone sinus exposed probed and found to extend up and down the bone for a considerable distance. The cavity was exposed by chiselling the superficial bone away The anterior wall of the cavity was chipped away for about 4 inches. It consisted of very sclerosed bone. Five large

about 5 inches in length was left in the humerus, without any anterior wall The upper and deeper end of the cavity was filled with six fat grafts taken from the fat overlying the deltoid. The remainder of the cavity was filled with a

by a figure-of-eight catgut suture over it. The incision was completely closed with fishing gut The skin over the deltoid, outer flap and remainder of scar were scored.

Bipp " Dry gauze Boric powder Arm put up against chest.

July 14, 1921 Dressed first time—6 days. One small granulating area, size of a little finger nail, at lower end of incision wound. Rest of wound healed.

July 27 1921 Soundly healed.

Summary Pens. C., age 26 wounded November 17

Dressed first time. All healed except one small area the size of little finger nail at bottom of incision wound. July 27 1921 Soundly healed.

As the cases show it is possible to obtain healing of these septic cavities by "first intention' and though some of them may take a long time, failure, as I have proved is an infrequent event. In my recover skin co flaps are apt to slough, and skin edges united immediately over the packing are apt to separate and expose the underlying fat. In spite of this exposure the fat if protected is not extruded, but after a long time becomes vascularized the

nary bone cicatrix. I have watched with great interest this happening in many cases which I have had the opportunity of observing for weeks, until healing had at last followed. Scoring flaps is sometimes sufficient to prevent death of them, from arrest of circulation by oedema, and this should always be done. In doubtful cases such as those with multiple cavities, or those in which it is difficult to see to the bottom, operation in two stages is an advance on our earlier methods, and we have recently adopted it when skin flaps are necessary to cover the cavities especially in such

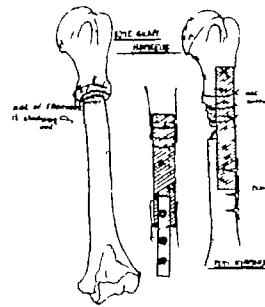


Fig 54. Diagram of operation in Case 30

positions as in the head of the tibia, which are specially difficult. In these instances, after preparing the cavity, we outline the skin flap by a deep incision all round except at the side to be left as a future pedicle. By this means we hope that in 3 weeks the circulation through the pedicle, increased by cutting off the blood supply from other directions will suffice to nourish the flap, but our experience with this method is still insufficient to allow of confident statements

In civilian practice this method of treating bone cavities is applicable to the slowly healing results of bone infection and necrosis. I have also used it in the case of a girl from whose lower jaw I had scooped out a myeloid tumor the size of a large orange (Figs 33 and 34) The big wound healed after 12 months but left a large deforming depressed cicatrix adherent to the cupshaped cavity previously occupied by the tumor After dissecting away the cicatrix and removing some of the superfluous bone I filled the cavity with fat

harder until now a year after the operation the old cavity is filled with bone though it is not yet entirely dense to X rays.

The only addition I have made to the methods described in the bipp' book is that now the skin around the wound is dusted with sterile boracic powder before the wound is dressed. It is also not always wise to aim at the surgical triumph of a wound healed under a single dressing

left untouched for 3 weeks Blood escaping into the dressing makes it moist, and especially when old scars are present these are apt to break down and produce raw septic areas, which interfere with primary healing A second dressing performed at once with gauze wrung out of spirit may save the situation, and it is preferable to the pickling which we found so serviceable in the

Bone Grafting

The first patient I am exhibiting shows the result of a failure in technique Five weeks after the operation when his arm was dressed because of discharge through the dressings, it was found that the wound had broken down at the upper end and the arm and the leg from which the graft was taken were both suppurating

What is the explanation?

This patient was the first upon whom I had operated in an entirely new environment—new assistants, new nurses, and new surroundings over which I could exercise little control While the graft was being removed from the tibia I noticed with sudden surprise that the flow of saline used to cool the Albee saw was splashing from it into my chief assistant s face, and was running in a stream off his nose on to the tibia from which the graft was being taken. This was, of course stopped at once, and the operation was not proceeded with until the sawn tibia had been drenched with saline. There cannot be any doubt that infection of the graft was caused by this mishap for both arm and leg suppurated. This experience is a gross one but it teaches the need for a trained team, accustomed to work together for this purpose.

It seems as if the technique necessary to ensure

orders that patients should be treated by this means at the Northumberland War Hospital. Ten per cent broke down under the influence of radiant heat. Since then all our cases are subjected to a preliminary 10 days of treatment of their scars by radiant heat. If the result of this is negative, and if after operation any infection should develop we blame not the patient, but his surgeon.

In bone grafting I still perform all manipulations with instruments only as an additional safe guard against infection of the wound though no wound with our present methods is absolutely safe. Perfection in wound technique has not yet been attained. Any doubt as to the truth of this statement has been settled by Dr Laws, who has had cultures made from our operating theaters during operations. These prove that organisms are constantly dropping into our wounds from the air and though, judging by results, very few of

Fixation of the graft by metal plates has been

in spite of surgical agreement to the contrary to use metal plates for special cases. In the humerus and in the femur I do not think any method of fixation can equal the metal plate, if the bone is firm enough to hold screws. If it were true that a plate prevented osteogenesis so that the graft could not unite plates would, of course be taboo

B In the
fi nds of
th lower

end of the humerus was already firmly united to the graft. Ordinarily the ingenious methods of

powerful antiseptic. It is also certain that if plates, of which I am going to say something

infection—is emphasized It is advised that months should elapse after the wound is healed before any such operation is undertaken. Early in the War A. E. Morrison, of Sunderland, informed me that he had found radiant heat the best test for healed wounds of the extremities, and I gave

superficial bone, or in the neighborhood of old

femur, unless it causes trouble It is best left alone One of the soldiers admitted to the Northumberland War Hospital under my care had had his femur plated by the late Professor Sinclair White of Sheffield, 15 years earlier He had been in the thickest of the fighting for a year was football expert in civil life, had never had any trouble after

his recovery from the fracture and X ray showed the plate to be as firmly fixed as it could have been when it was first put on I started surgery with a prejudice against plates or any other unabsorbable foreign bodies, but now know that both are sometimes good. There is just one caution as to their use. They are dangerous for surgeons who cannot feel confident that wound infection will not follow their operations.

Experience at the Northumberland War Hospital has taught me that, when bones are shortened by loss of portions of them, if the broken ends are brought together and held there, union seldom occurs. My explanation is that the stimulus of contracting muscle is lacking in these cases and that this inhibits osteogenesis I do not know whether the explanation is correct or not, but there can be no doubt as to the difficulty of obtaining union. If this view of mine is correct the step graft method is a bad one.

The cases exhibited emphasize these points, and may elicit others for discussion.

CASE 24. Pens. C., age 30. Gunshot wound right shoulder Wounded April 14, 1918 In France He has had 4 previous operations. The bone has never united.

On admission we found entry wound at junction of

upper fragment of the humerus was so soft that the plate was tied on to it with thick catgut, no screws being possible.

December 28, 1919. Dressed first time—5 weeks. The wound had opened up and was infected, and the upper half of the bone graft was uncovered. Firm union had

over the anterior aspect of the upper end of the right humeri
seen.
health
and it
sequestrate. Thick new bone firmly attached above and below Head of humerus rotates freely with new shaft.

Summary Pens. C., age 30 wounded April 14, 1918. Four previous operations. Gap in humerus. Operation—bone graft—November 17 1919. Professor Morison. Dressed December 28, 1919. Wound opened up. Graft exposed. Union lower end of graft. Upper end free. November 30 1920. Graft still exposed, but union firm. Humerus reproduced.

CASE 25. Pens. P., age 24. Gunshot wound left forearm. Both bones fractured. Wounded October 27 1918.

January 1919. On the ulnar border of the left forearm, about center there is a scar 2 inches by 1 inch on flexor surface, a scar 3 inches by 1 inch on extensor surface,

February 8 1919 Operation Professor Morison Northumberland War Hospital. The three sinuses present were opened up Two sequestra from radius and one from ulna were removed. The upper fragments of the radius and ulna (ununited) were chiselled and the chiselled portion turned into the gap The lower fragments were freshened The whole surfaces were 'bipped' and the wound over extensor surface which had been opened up more exten

applied.

April 6 1919. Dressed Healed. No union in radius Put up in plaster of Paris. X-ray showed lateral position good. There is a slight angle pointing forward but no bones are in contact.

September 1 1919. Operation Bone graft to radius There were two healed scars over front and outer side of forearm. An incision was made over the front of the radius between the pre-existing scars, avoiding both The radius was approached by deepening the incision between the flexor carpi radialis muscle and the supinator longus. As the fractured ends of the radius were exposed they were found ununited, with an imperfect attempt at fibrous union. A flap of bone and periosteum was turned down from the upper fragment. A flap of bone and periosteum was turned up from the lower fragment forming a bed to receive the graft. An incision was made over the inner surface of the tibia and a graft of bone and periosteum was cut to size from the front of the tibia Before the graft was removed from its bed, a plate, longer than the graft, was fixed to it with 2 screws, the protruding ends of the plate being secured to the upper and lower ends of the

October 31 1919. Lower screw has sprung—graft still in

him inconvenience.

January 28 1921 Operation (removal of plate) 1 year and 4 months after grafting operation. The tissues were found to be so firmly incorporated with the plate that they had to be cut off it. No sign of irritation. The lowest
had a
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ing

Lane plate. October 31 1919 Lower screw sprung Dis-

January 14, 1921 Dressed for first time—3 week

of Paris bands.

February 7 1921 Dressed for second time Quite dry A small unhealed spot (pin head) Rest of wound healed. Union felt firm Put up in plaster-of Paris, with window

The lower

The irregular end of the upper fragment was sawn off transversely The arm was then forcibly manipulated to

Graft removed and fitted into interval in radius. The remaining screw on each plate were fixed to the upper and lower fragments of the radius respectively The muscles were sutured with three figure eight sutures of

but bone felt quite firm Patient very anxious to start work

Summary Penn P age 38, wounded September 28, 1918 Fracture of radius X-ray showed gap in radius No union Operation Professor Morrison November

state that the head of the humerus was removed

On admission July 16 1920. Absence of head of left humerus There is a healed scar running downward on

August 10 1920. Dressed first time— 8 days Upper two thirds of wound healed by first intention At lower

third an opening discharged seropurulent fluid. Re-bipped."

September 13 1920 Healed After 10 days of radiant heat, the patient was discharged soundly healed.

January 10 1921 Patient returned for fixation of shoulder to have radiant heat for 10 days

January 20 to 1 Finished radiant heat treatment. No breaking down of scar Patient has been wearing an abduction frame made to fit him for a few days, to ensure its being comfortable after the operation.

January 21 1921 Operation Professor Morison. Lateral incision over site of destroyed deltoid down to the

graft was plated down to the humerus in the plateau already prepared. The acromion process was then split horizontally and the lower half was fractured downward to the graft (as illustration) An osteoperiosteal graft was chiseled up from the tibia and placed in position over the bare outer surface of the graft and sawn acromion. Fibrosed muscles were sutured over with catgut. Skin edges approximated with catgut. The arm was put up in abducted position on a frame and fixed with plaster-of Paris.

March 7 1921 Dressed for first time—6 weeks and 3 days Wound healed with the exception of two areas—one at the lower edge of the wound, the size of a split pea, the

firm. There is good movement of scapula. The arm is to be taken down from abduction frame every day for massage and dressing

April 28 1921 Arm in good position—down to side now Not quite healed Plate appears to rock—to be removed

May 6 1921 Operation. Plate removed.

June 13 1921 Healed Mass of callus union not solid

June 17, 1921 Arm put up on abduction frame with plaster of Paris.

Summary Pens. R.P W., age 32 wounded April 13 1917 Seven or eight operations before admission. Head of humerus had been removed for ankylosis of humerus to scapula Last operation January 21 1921 Professor Morison. Bone graft. Plate at lower end March 7 1921 First dressing—6 weeks and 3 days. All healed except

prisoner by the Germans for 10 months and was operated upon during that time. Has had 3 operations before admission.

February

third non-u

degrees of

beyond 90 wrist stiff at about 180 fingers stiff and contracted by flexor tendons.

February 17 1919 There are the remains of a median nerve lesion in this case with some sensory loss in index and thumb Despite the appearance of the arm, every muscle has power and reacts to faradism except perhaps opponens and abductor pollicis.

May 23 1919 For bone graft or wiring

May 30 1919. Left hand cock up splint. Movements wrist and finger joints under gas

September 22 1919 Operation Long incision was made and the wound scar was included in the ellipse and excised The musculospiral nerve was identified and retracted. The lower end of the bone was found very much rarified—marrow soft almost fluid and yellow The two ends were stepped" and wired The musculo-spiral was displaced to a more superficial position and embedded in muscle Arm fixed in abduction splint X ray showed both wires round upper fragment and ends separated without union

November 24 1919 Operation Incision as before Musculospiral nerve identified and displaced The ends of the fragment were sawn across until a flat healthy surface was reached. A plate of boiled beef bone (shin of ox) was drilled with 2 holes at each end, and the ends of the fragments were drilled also. These were threaded with kangaroo tendon and tied securely The whole length of the graft was wrapped closely to the fragments by chromic catgut. Muscles sutured with catgut, skin with silkworm gut. The wires were removed at an early stage

December 2 1920 A stitch at upper angle has suppurated—small Carrel tube inserted.

January 11 1920 Transferred to Newcastle

January 14 1920 In plaster Awaiting bone graft

spiral nerve was identified in the scar and retracted to the outer side of the bone the ends of which were turned out.

scraped out for just over one-half inch

A pointed graft sharpened at one end only was then cut from the left tibia with the Albee saw and the pointed extremity was driven into the gouged-out medulla of the lower fragment The upper end of the graft was then brought into apposition with the upper fragment, lying on

was passed underneath the upper fragment and over the plate and screws A small osteoperiosteal graft was chiseled up from the tibia and applied to the junction of the bone with graft at its upper end Muscle and scar

tissue were approximated over graft with catgut sutures. The skin was sutured with silkworm-gut. The arm was put up on celluloid abduction splint with plaster-of Paris jacket and bandages Leg wound closed with fishing gut.

March 11, 1921 Dressed first time—6 weeks A little moisture, about ½ dram, on dressing—not purulent.

Entirely healed and union firm

CASE 30 Penn K age 27 Gunshot wound left humerus. Wounded September 16 1916, in France by shrapnel Fracture Has had 5 or 6 operations when attempts were

squared off and cleared of scar Step cut performed on the two ends Two holes were drilled and silver wire was passed through tightened and the sharp ends buried The muscle was closed over bone, and the wound sutured The

ly and without peared excellent was found that

or Morrison Ex Non-union exposed The wire inserted in the previous operation was extracted What union

drilled in the lower fragment of the humerus and screws inserted. The bony tissue of the upper fragment would

scars had broken down in several places and left pretuberant granulations. Incision scar was all healed except for pin head granulations opposite six of the sutures The anterior scar had broken down, forming granulating area size of sixpence Union of graft appeared quite firm

daily

April 28, 1921 Still a granulating area in center of scar

June 13, 1921 Two small granulating areas—at the bottom of each of these bare bone could be felt. Large amount of callus, but union not solid.

July 1 1921 Granulations have been touched up with nitrate of silver The arm has been put up on abduction frame with plaster-of Paris

July 15 1921. Operation Plate removed Firm union.

Summary Penn K age 27 wounded September 16 1916. Fracture of left humerus Five or six previous

removed Bone firmly united

CONCLUSIONS

Clinical observation and experience are still of

the bipp method of treatment of infected

tention may follow

If it is possible to close infected wounds with impunity it should also be possible to open abscesses and after treatment of them with antiseptics, close them again. The cases recorded show that this can be done.

Septic bone cavities have been the most prolonged and troublesome results of the late War The largest and most obstinate can heal after treatment by the bipp method and if filled with fat grafts, by first intention

Bone grafts Lane plate fixation of bone grafts can be successful where other methods have failed.

THE MOURE OPERATION FOR REMOVAL OF LARGE GROWTHS AND FOREIGN BODIES FROM THE ANTRUM[1]

By VIRGINIUS DABNEY M.D F.A.C.S., WASHINGTON

THOSE of us who had the pleasure and profit of studying in the clinics of Germany and Austria in those halcyon days before the Great War will doubtless recall how aghast we sometimes were at the operative procedures we witnessed there which seemed to take no account of cosmetic results and to ignore the comfort and convenience of the victims. Thus, the operation of lateral rhinotomy which Moure developed and really devised would appear to be a mutilating and bloody procedure, whereas, properly performed it is neither the former nor especially the latter. It is due to the boldness of conception and skill of performance associated with an intimate knowledge of the special anatomy involved, that such operative methods are devised and are successful in their performance.

The especial place for this operation is where the naris is crowded with neoplasms, either benign or malignant single or multiple, which are evidently overflowing from the antrum though there are usually in addition independent foci in the ethmoid and even sphenoid and moreover where repeated removal through intranasal methods has proved futile in preventing recurrence. Usually deformity and dislocation of the eye cheek, and nose especially the eye occur before the extensive nature of the disease suggests itself to the attendant or patient. The reason for this is that an accumulation in the open naris does not cause the deformity as a rule but that one in the interior of the antrum does. Thus, while the growths are being removed carefully and thoroughly from the open cavity of the nose those in the antrum continue to grow and their pressure increases, despite the intranasal work, until the cheek, eye and even the roof of the mouth show the characteristic deformity of great and unrelieved pressure.

The technique which I employ is essentially that of Moure, aside from those minor details which every surgeon is apt to exhibit such as the control of hæmorrhage the use of retractors and the postoperative care. Argyrol is first instilled in the eye of the operative side, the face is then painted with tincture of iodine, which is immediately removed with alcohol, and the eye covered with a pad wrung dry from a bichloride solution. The usual towels are draped over the head and neck to cover all but the part to be attacked. A curved incision is made parallel with and one eighth inch below the infra-orbital margin beginning at and below the outer canthus and extending to a little below the inner canthus. From this point it is carried straight down along the juncture of the nasal ala and the face to the edge of the nasolabial junction. The bleeding is, of course, brisk and must be controlled as the incision is lengthened step by step as the blood will completely obscure the field and prove very embarrassing unless so arrested. Having secured a practically dry field the periosteum is now elevated, and it must be done with the utmost care and thoroughness avoiding not only tears but also leaving *in situ* any of its extent. Upon this seemingly unimportant detail depends at least half of the success of the surgeon's attempts to secure a good cosmetic result. In order to prevent bruising of the parts and the possible formation of slough it is important at this stage to remove all artery clamps where they can be dispensed with and to retract this roughly triangular flap with a loop of silk run through the apex of the tissues, in other words not with metal retractors. Here again an effort is made to insure primary union of the soft parts for reasons previously stated. The ala of the nose is now elevated and access gained to the nasal bone and the nasal process of the superior maxilla, and all hæmorrhage controlled. Before proceeding with exposure of the interior of the antrum and naris, the posterior naris is packed and the use begun by the anæsthetist of an aspirator such as is used in tonsil operations. This instrument must be kept continuously in the throat to catch any blood that may escape through or around the nasal packing until all the growths have been removed the hæmorrhage controlled, and the general cavity packed. The separation of these masses especially when malignant is attended generally by profuse flow of blood which of necessity, would proceed down the rhinopharynx and into the trachea unless preventive measures had been taken well in advance even so it is at times necessary to renew the packing because of its becoming saturated with blood. With a square-edged chisel a section of bone is now marked out corresponding in extent and contour with

[1] Read before the American Academy of Ophthalmology and Otolaryngology October 9 9

the skin flap but with this additional area the posterior half of the nasal bone and so much of the nasal process as may be necessary to allow free inspection of the interior of the nose and the ethmoid. When this area marked out by the chisel has been broken out with suitable forceps, there lies before the eye the entire interior of the antrum and nose, easily accessible to any instrumentation that may be required by the special necessities of the case. No other method will so reveal this general cavity or even if attempted will do so with such safety and thoroughness. It is now an easy matter to remove all growths from their numerous attachments either in nose or antrum, and I personally prefer the finger where possible, supplemented by curettement of the entire surface and removal of all tags and shreds with any grasping forceps my preference being the Luc After packing with gauze impregnated with Dakin oil solution the wound is sewed up in two layers, care being

[illegible] To end [illegible] the [illegible] oved

on the third day An ice bag is kept on the cheek continuously for 2 days. In the absence of

the room necessary for it and for free inspection Gentle, warm saline irrigation two or three times daily is usually all the after-care that is required in benign cases However in the presence of malignancy the wound cannot be closed but must be left open and treated as any other open wound, and the use of the X ray and radium pursued in With this exception, generally there is no depression or deformity in the face In fact, where primary union takes place the scar is hardly visible

The removal of foreign bodies by the route of this operation is essentially the same as described for that of neoplasms though the interior of the nose may not require exposure and, in this event the removal of the bony flap involving the nasal bone and the nasal process may be omitted However it will still be necessary to elevate the nasal ala and push it aside to give sufficient room for manipulation of the rest of the flap Foreign bodies gain entrance into the antrum and nose as the result of industrial accidents, such as the breaking of a

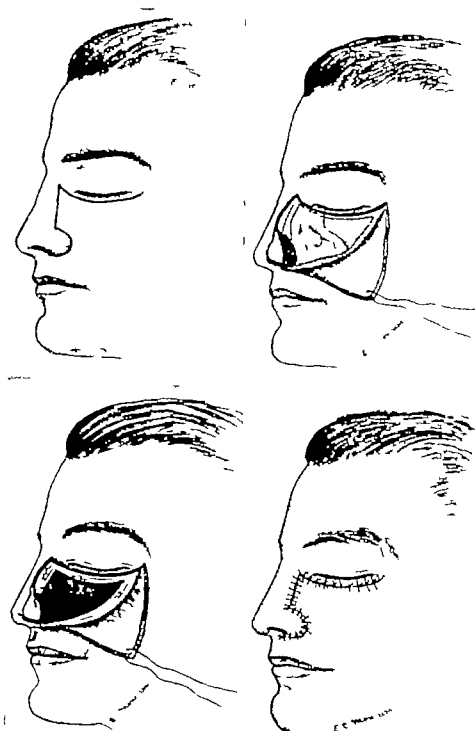
numerous where projectiles in whole or in part found their way into the antrum. In this latter type of injury the skin incision must take into account the wound of entrance and will accordingly depart from the classical incision described here. For instance, there came into my hands a soldier who had received a piece of shell casing just below the malar bone which had made its way into and through the antrum emerging

angle was reversed being at the infra-orbital margin and the shape of the incision was more crescentic than triangular including the nasal incision within its curve. This young man had had for years an empyema of that antrum which was permanently cleared up as an incident of the operation for removal of the fragment of shell casing

To anyone who has done war surgery and to plastic surgeons whose extraordinary achievements during the war are well known this operation is almost absurdly easy but it was not given to all of us to have such experience and thus the Moure operation as a means of creating and approaching the joint cavity of antrum-nose-ethmoid should be kept in mind and a description is not out of place for the rhinologist.

Rather than giving the arid details of cases I will describe only one especially as this patient had the rare and somewhat undesirable experience of having both sides operated upon the second operation involving the frontal sinus as well as those usually affected

time the right naris was free of growths, but the left was now full as in the first instance, the cheek bulging, the eye prominent downward and forward, causing the



Author's modification of Moure operation to remove large growths and foreign bodies from antrum.

crowded with fibromyxomata However as the brow was distinctly soft and bulging and the orbital plate

ample drainage into the nose Thus, the frontal sinus, nares, and antrum were thrown into a common cavity

operated upon, there was a return of the growths, though he appeared well and was not in especial discomfort from this accumulation He has not returned now for a period of 2 years.

This operation appeals to me for its safety rapidity o
of remova
Nothing c
part of the operator to see what he is doing and what the conditions require him to do Such desiderata cannot be obtained so well, if at all by any other method of relieving the condition for which the Moure operation is devised and properly applied

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PRACTICAL METHOD OF FIXATION IN FRACTURES OF THE MANDIBLE[1]

By ROBERT H IVY M D F A C S Philadelphia
Professor of Maxillo-Facial Surgery Graduate School of Medicine University of Pennsylvania

SURGEONS as a rule show little direct interest in fractures of the lower jaw and the principles that should govern the fixation of these injuries frequently appear to be imperfectly understood The usual method adopted is the application of the Barton or other head bandage, in the belief that this provides sufficient fixation The bandage alone is no more reliable here for retention after reduction of displaced fragments than it would be in a fracture of any other bone Only cases which would do well without any form of fixation whatever show satisfactory results after treatment with the bandage In the mandible, more accurate restoration of the parts is essential than in other bones, because the slightest deviation will produce mal-occlusion of the teeth and interfere with mastication The essential principle to be followed therefore, is fixation of the fragments in proper relationship with the upper jaw In order to minimize infection and the prolonged treatment resulting therefrom this fixation should be applied as soon as possible. It is impossible to maintain the upper and lower teeth firmly in occlusion with a bandage, and if the fragments are properly fixed otherwise, no bandage is necessary except to hold a dressing in case of external wound. Sometimes in a case of difficult reduction, the surgeon may be tempted to wire or plate the fragments, forgetting that *nearly all mandibular fractures are compound* into the mouth and are constantly bathed in the oral secretions. *Infection* occurs around the wire or the metal plate inviting osteomyelitis with sequestrum formation and great delay in union. The only justification for wiring or plating of the fragments is one of those rare cases of fracture in an edentulous person where the oral mucous membrane has not been broken and where there is consequently a chance of maintaining asepsis. Even here, the wire or plate usually gives insufficient stability

After a mandibular fracture has been treated unsatisfactorily for several days, either by the request that an interdental splint be made. In large cities these patients come to the dental college clinics. It is unquestionably true that some form of interdental splint is one of the best methods of fixation and in a few cases with great comminution and displacement is the only satisfactory treatment. There are many practical difficulties which interfere with successful employment of the interdental splint The making of a splint demands considerable experience at least 2 days of time devoted to nothing else, and involves some expense Most cases of fracture of the lower jaw occur in persons in poor circumstances who apply for treatment at free *dispensaries or dental colleges, where students* have to be depended upon for the making of

Presented at the meeting of the Clinical Congress of American College of Surgeons, October 1st, 1921

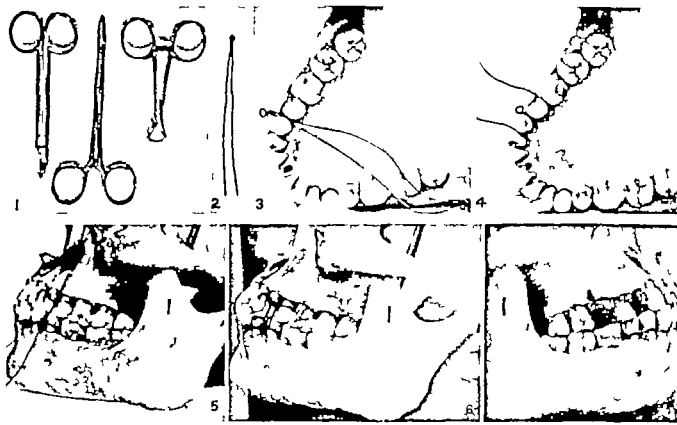


Fig. 1 Instruments required for manipulating wire teeth.

Fig. 4. Ends of eyelet wire carried around premolar teeth back to buccal surface.

Fig. 5 Eyelet wires attached to upper and lower premolar teeth Connecting wire passed through eyelets

Fig 6. Upper and lower teeth fixed in occlusion by connecting wire passed through eyelets Ends of wires twisted, cut off, and bent over

Fig 7 Eyelet wire attached to single tooth in upper jaw

splints. Busy dentists, even though experienced in this work, cannot give up all other patients and devote at least 2 days to making a splint. Dental students have other duties such as attendance at classes to interfere, and moreover are insufficiently experienced to produce accurate splints in the desired length of time. Under these circumstances usually from 2 to 3 weeks elapse between the taking of the impressions and insertion of the splint, which even then may not fit accurately In the meantime, unless some other means of fixation has been used, the fracture is in process of union in malposition. Therefore, for fixation of the average case of mandibular fracture we do not now depend on splints but employ immediate ligation of the lower to the upper teeth thus reducing and fixing the fracture the first time the patient is seen This being accomplished the case may be carried to completion by means of the wiring or the wires may temporarily suffice until a splint can be made and inserted

The object of this communication is to bring to more general notice a method of wiring the teeth which with a little study and practice should be easily acquired by any surgeon and enable him to handle satisfactorily these cases of fracture of the mandible himself particularly in localities where specialists are not available. In this way fixation of the bone and care of the soft tissues are under one person as in other fractures, and there is no division of responsibility

The method advocated here is a modification of that devised by Colonel Robert T Oliver[1] Dental Corps, U S Army, developed by Major Joseph D Eby of the same corps and adapted to civil life injuries by the writer The wire used should be of such a size that it will pass freely through the spaces at the necks of the teeth and composed of a soft, yet resistant metal For routine use two kinds of wire are employed 22 or 23 gauge copper wire, and the large size (24 to 26 gauge) Angle s brass ligature wire obtainable at any dental supply house. In emergencies soft silver wire is usually to be found in every hospital or an efficient substitute in the form of soft iron

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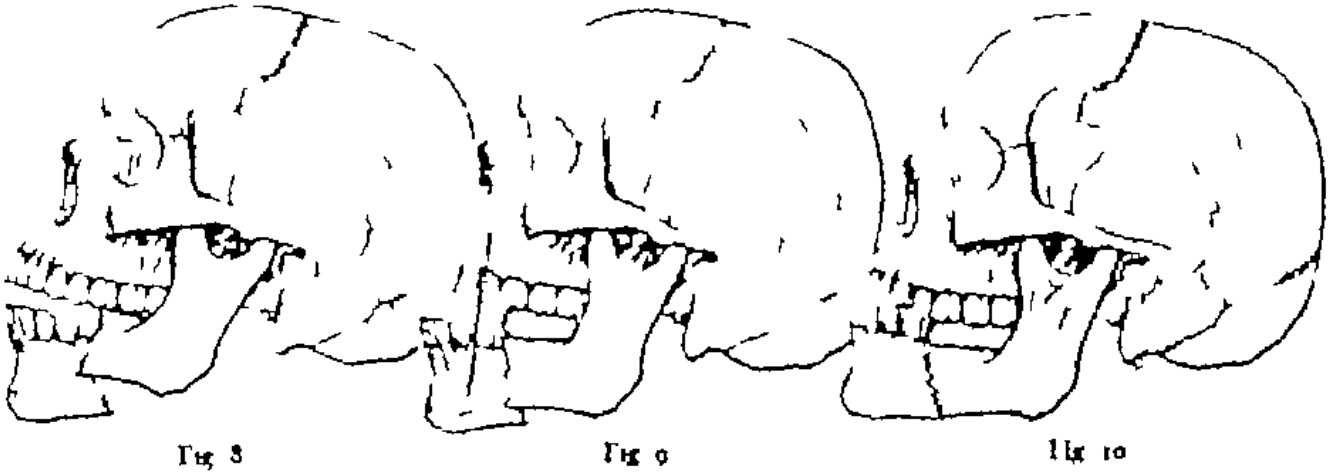


Fig 8 Fig 9 Fig 10

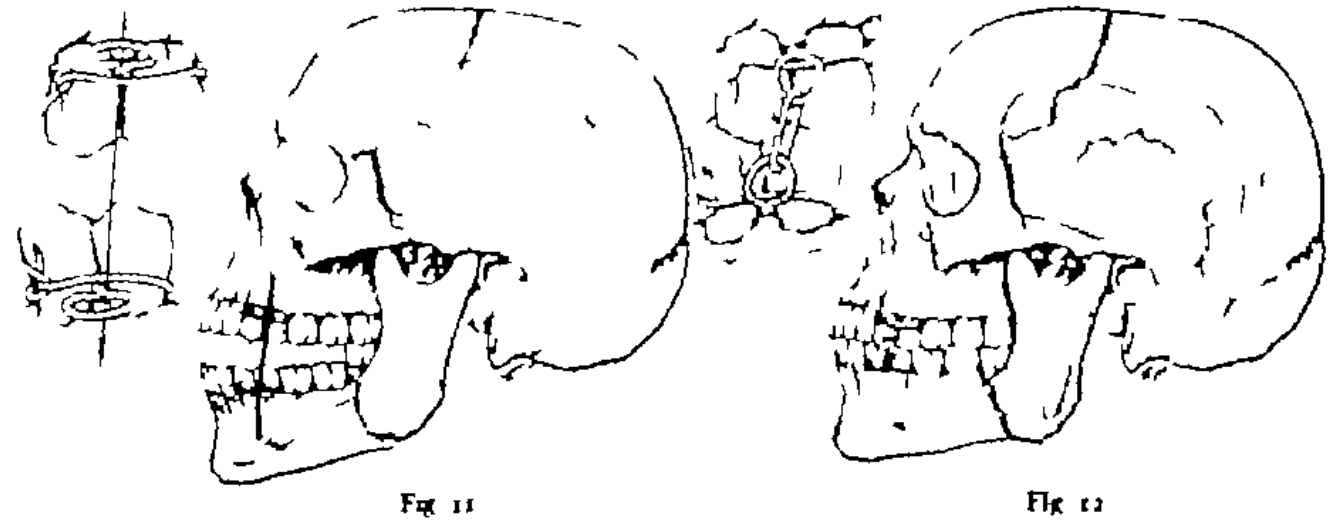


Fig 11 Fig 12

Fig 8 Fracture with a long posterior edentulous fragment which has been drawn upward by the muscles of mastication

Fig 9 Posterior edentulous fragment kept down by piece of impression compound

Fig 10 Fracture reduced and anterior fragment fixed by wires

Fig 11 Retention of tooth in line of fracture to prevent tipping up of posterior fragment

Fig 12 Fracture reduced and fixed by wiring teeth

binding wire can be purchased at any hardware store The instruments needed are a pair of hemostatic forceps a pair of short nosed scissors, and a tenaculum or a Backhaus towel clamp (Fig 1) In preparation of the wire to be attached to the teeth a six inch length is folded around the tenaculum or towel clamp, and a loop is twisted in the form of an eyelet (Fig 2) Where there is a good dental interspace, the copper wire is used as it makes a firmer attachment Where the teeth are set close together as in the case of the lower incisors, the brass wire is employed. After selecting the teeth to be wired both ends of the eyelet wire are inserted from the buccal surface through the interproximal space for example of the two lower premolars (Fig 3) One end is drawn through around the anterior tooth and the other end around the posterior tooth on to the buccal aspect (Fig 4) This process is repeated on corresponding upper teeth. Then the ends of the wire in the case of the lower teeth are twisted together with the eyelet projecting below the twist. In the case of the upper teeth, the eyelet projects above the horizontal twist. In this way the upper and lower eyelets are prevented by the horizontal strands from coming too close to each other when subjected to the strain of the connecting wire to be described Tightening is done by grasping the ends of the wire with the hemostatic forceps, drawing the wire away from the teeth and twisting carefully at the same time. The eyelet may be prevented from disappearing in the interproximal space by engaging it with the towel clamp The ends are then cut off short and

desirable a third set of teeth is similarly wired in

the incisor region The upper and lower eyelets are now connected by passage through them of a third connecting or tie wire, the brass wire being used here (Fig 5), the teeth brought into occlusion and the ends of each connecting or tie wire twisted together, cut off short and turned in (Fig 6) In some cases of displacement the desired movement of a fragment to restore proper occlusion can be produced by placing the upper eyelet in a position to the right or left of that of the lower eyelet as the case may be, instead of directly opposite. Complete reduction may not immediately follow placing of the wires, but will generally occur on taking up the slack of the connecting wires after 24 hours. A great advantage of this method is that if one wire breaks it can be easily replaced without disturbing the other eyelet wires. If the patient is to receive an anæsthetic, the eyelet wires may be placed before or during the operation and the jaws fixed with the connecting wires after the danger of nausea is past. The tie wires may be cut at any time in order to test the fracture. If consolidation is not complete the tie wires may be immediately replaced The wires tend to loosen every few days but can be easily tightened. The slight motion of the jaw due to loosening of the wires, as compared to the absolute rigidity of splints, is an advantage in the later stages of treatment, as it tends to stimulate bone regeneration. With the teeth wired in this way the occlusion of the teeth is always under direct observation. Interdental splints usually cover the cutting edges and occlusal surfaces of the teeth, there often being a thickness of metal between them The state of *the occlusion cannot be observed during treat* ment, and when the splints are removed there may be considerable malocclusion It is quite as easy if not more so to maintain cleanliness of the mouth with the wires as with splints. With attachment of the wires at three different points the strain is well distributed and there is little tendency to loosening of teeth from this source

In a series of over thirty mandibular fractures treated during the past year this method of wiring was satisfactorily employed in all except two regardless of the seat of the fracture. In one case, no teeth were present in the mouth and in the other an incomplete fracture at the angle without displacement, not even a bandage was required This method necessarily entails locking the upper and lower teeth together *no matter* where fracture is situated But the disadvantage of this is not so important as the delay usually encountered in having a splint made.

When a tooth necessary as a point of fixation in one jaw stands alone and it is impossible to attach the usual eyelet wire the attachment may be modified by twisting around the neck of the single tooth with eyelet on labial or buccal surface (Fig 7)

Occasionally a fracture of the body of the bone will be encountered in which molar teeth have been lost, leaving a long posterior fragment without teeth. In a case of this kind there is generally a tendency for the anterior end of the posterior fragment to be tilted upward by the temporal masseter and internal pterygoid muscles, until the soft tissues covering the fragment meet the occlusal surfaces of the upper molar teeth (Fig 8) To bring about reduction here, a piece of softened dental impression compound may be inserted to cover the gum over the posterior fragment, filling in the space between it and the upper molars, and allowing it to harden *while the mouth is open (Fig 9) The impression* compound is then removed from the mouth trimmed to as small dimensions as possible and reinserted. The teeth on the large mandibular fragment are then wired in occlusion with the upper teeth the impression compound at the same time keeping the posterior fragment down in place (Fig. 10) The compound may remain in the mouth for several days without change.

Ulceration of the gum overlying the posterior fragment sometimes is seen from pressure of the last upper molar In this case it may become necessary to extract this tooth.

Roots of teeth encroaching on the line of fracture frequently give rise to infection sooner or later and as a general rule the wisest plan is to *remove them early provided this can be done* without too much traumatism to the fracture. However in certain cases it may be advisable to retain such a tooth for a time even at the risk of infection. This applies to a fracture just in front of the last molar tooth where loss of the tooth would mean upward displacement of the posterior fragment owing to lack of opposition from the upper molars (Fig 11) After a week or 10 days of reduction the posterior fragment will usually remain down in position and the tooth in line of fra

low

retention of over 90 per cent of fractures of the mandible met with in civil practice. For the occasional case complicated by marked comminution or loss of bone substance with destruction of teeth in

required

connecter

POSTOPERATIVE PERITONEAL ADHESIONS

An Experimental Study

By CARL S WILLIAMSON M D and FRANK C MANN M D Rochester Minnesota
Division of Experimental Surgery and Pathology Mayo Foundation

DURING the last 5 years we have made cursory observations on the formation of postoperative peritoneal adhesions following various operations within the abdominal cavity and have tried out most of the procedures recommended for the prevention of adhesions. It is our purpose here briefly to give the results of these experiments

The methods employed to prevent peritoneal adhesions may be divided into three groups (1) prophylaxis, (2) foreign substances for the purpose of keeping the injured surface from contact with any other surface of the peritoneum and (3) the retardation or inhibition of some element in the process of healing

There is no doubt that the employment of prophylaxis, as emphasized by so many investigators of this subject, is the most important means at the surgeon's command of preventing adhesions Whatever decrease there has been in postoperative adhesions can be attributed mainly to the development of better technique in which

process of healing and in this respect should be properly guided by the surgeon and not necessarily prevented In many operations, the formation of a certain amount of adhesions is desirable. In other operations, either because of absolutely necessary operative trauma or resulting pathological conditions, raw peritoneal surfaces are unavoidable and impossible to repair Adhesions form on this base, and remedial measures only make the condition worse. A method which would prevent the formation of adhesions and yet allow normal healing would be of inestimable value in such cases It was with the hope of discovery of such a method that our researches were conducted

In attempting to prevent peritoneal adhesions, innumerable methods and substances have been recommended, for example the stimulation of active peristalsis by purgation change in the posture of the patient various oils intraperitoneally such as liquid vaseline and olive oil fluid such as normal salt solution non-absorbable membranes, such as rubber dam, oiled silk silver foil, tin foil, and collodion absorbable membrane such as catgut, cargile membrane, amniotic membrane and fish bladder viscid substances such as glucose, dextrin and gum acacia various irritants, such as iodine and ether and substances which will prevent the process of healing such as sodium citrate and fibrolysin.

In attempting to determine whether any of the various methods or substances recommended are of value in the prevention of adhesions, it is necessary carefully to standardize the method of operation We found this rather difficult since

in dog and in man While we employed various species of animals, particularly the dog and the rabbit, we were convinced that conclusions applicable to man could only be drawn from the experiments performed on the dog We also found it difficult to standardize a procedure involvin- [illegible] the wide [illegible] of adhesi [illegible] ure After a number of observations, we found a technique which suited our purpose admirably

TECHNIQUE

The operative procedures were carried out under complete anesthesia and sterile technique [illegible]

adhesions between the traumatized surface and the parietal peritoneum on the upper side and the adjacent abdominal organs on the lower side always occurred. The material to be tested was [illegible]

should be noted that adhesions never failed to [illegible]

abdomen was closed and after a definite length of time, at another laparotomy the formation of

adhesions on the two surfaces of the liver was noted. In a few instances in which the material to be tested was not adaptable to this technique various intestinal operations were performed and the material used over the line of suture. The latter experiments serve to emphasize the fact that the reaction of the peritoneum varies considerably in individuals

RESULTS

Practically all the substances used to prevent peritoneal adhesions by keeping the injured surface from contact with other surfaces until healing takes place, can be included in three groups (1) fluids, (2) substances which are absorbed, and (3) substances which are organized. We soon found that each group had some unsatisfactory elements. Fluids such as sodium chloride, are hard to apply because they do not remain at the site of trauma but gravitate to other portions of the abdominal cavity depending on the position of the body Substances that are absorbed, such as cargile membrane, may produce more reaction in the process of their absorption than the original trauma. Substances necessitating organization, such as rubber tissue and oiled silk, have the disadvantage of having to be removed subsequently

Many of the procedures that have been recommended to prevent adhesions in man are not adaptable to standard laboratory conditions we have, therefore, omitted some of them from our review The list of substances actually employed under the standardized conditions, as described includes paraffin oil olive oil, lanolin boric acid and lanolin sodium chloride, iodine, ether glucose, dextrin, silver foil, cargile membrane cat gut, and rubber dam Our results in the employment of all these substances may be summarized by stating that our experiments did not develop anything of value in the prevention of adhesions. In many instances the substances were decidedly harmful.

As we have stated the formation of peritoneal adhesions is a part of the process of healing and it is questionable if it is ever advisable to interfere with the normal process. Sodium citrate is supposed to preclude the formation of adhesions by preventing the formation of fibrin and thus the process of healing In our experiments it not only failed to prevent the formation of adhesions but in some instances it seemed harmful, since the oozing of blood from the traumatized surface was prolonged

After a careful consideration of the substances employed to prevent adhesions, it seemed to us that the value of such a substance would be enhanced if besides its usual attributes, it should liquidize slowly The ideal substance to fulfill such requirements should have adhesive qualities that would enable it to adhere to the site of the traumatized area thus keeping other surfaces from contact. The substance should dissolve slowly at body temperature and be absorbed from the general peritoneal cavity The rate of dissolution should be such that the substance will protect the traumatized surface for several hours It is almost needless to add that the substance should have many other characteristics, such as the possibility of sterilization inert as regards healing and the reaction of the peritoneum

After experimenting with many substances, a mixture of gelatin and gum acacia seemed to furnish the desired characteristics. Both of these substances have been employed previously for this purpose. Gelatin seems to have been discarded because it irritated the peritoneum acacia seemed to produce good experimental results but was never given an extensive trial the substances used separately have the serious objection of not adhering closely

The gelatin and gum acacia were made into a solution in the ratio of 25 per cent of each to 50 per cent of water and produced a substance which differs in some respects from either of the mother ingredients It has extraordinary adhesive qualities so much so that at body temperature it will stick to practically everything including the peritoneal surface. At room temperature it forms a semisolid. The gelatin-acacia mixture, placed in the peritoneal cavity sticks to the site of application causes absolutely no reaction dissolves slowly within from 4 to 8 hours, and is absorbed from the general body cavity

THE METHOD OF PREPARING AND APPLYING THE GUM ACACIA-GELATIN MIXTURE

The acacia should be obtained in lumps instead of in powder since the powdered preparation is not of a very good quality It is powdered in a mortar and then dissolved in normal saline solution An equal amount of gelatin is added and when both substances are thoroughly dissolved, the mixture is filtered through three or four thicknesses of gauze The filtrate is then heated on the water bath until it is concentrated to the point at which the fluid content equals about 50 per cent of the mixture While still quite hot the solution is poured into lead tubes of the type employed for tooth paste. After the tube is filled the open

end is closed by folding until it is tight. The tubes are placed upright in a container with the screw-end down and boiled in water from 20 to 30 minutes. They are then removed from the

ture, and then expressed at the desired site of application by simply unscrewing the top and rolling the closed end over the hæmostat. Care must be taken to keep the material from anything except the desired site, since its extreme adhesive qualities make it very difficult to handle.

SUMMARY

We have used the material in a large series of experiments and the results, on the whole, have been satisfactory. The traumatized surface of the liver heals well under the layer of solution. It would seem, therefore, that it has prevented adhesions, but bearing in mind the marked individual variation in the quantity of adhesions that may develop we hesitate to state that it is of much practical value in their prevention. Furthermore, we have not as yet worked out a complete, satisfactory method of making and applying the mixture, so we do not recommend it to be entirely safe from the dangers of infection. We can, however state definitely that of all the materials thus far advocated that we have been able to investigate experimentally the gum-acacia-gelatin mixture offers the best chance for development. Our investigation of the various substances recommended for the prevention of peritoneal adhesions convinces us that surgeons are not justified in using them in the abdominal cavity.

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NEPHROTOMY AND DECAPSULATION FOR ANURIA, IN A CASE OF SINGLE KIDNEY RECOVERY

BY SIMON S LEOPOLD M D AND MOSES BEHRENDT M D F A C S., PHILADELPHIA

THE references in medical literature to nephrotomy and decapsulation in cases of single kidney are sufficiently few to warrant the report of this case.

The case of W D Minningham operated upon by Dr Ill, of Newark, was one of congenital absence of one kidney in which nephrolithotomy was done for anuria of 23 days duration The patient recovered.

The case of Butler—an anuria of 13 days duration due to an inspissated thrombus, incident to trauma of the left kidney—was not truly one of single kidney, as it was found at necropsy that the right kidney was present, but atrophic.

The case of Tracy—a recurrent anuria, due to a calculus which operated as a ball valve in the ureter of a single functionating kidney—is not, strictly speaking, a case of single kidney as at previous operation only the lower pole of the other kidney had been removed.

In Minningham's case, one kidney was congenitally absent. In Butler's and Tracy's, both kidneys were present, although in Butler's case one kidney was atrophic, and in Tracy's, one was diseased

The case here presented is we believe unique in that right nephrectomy had been preformed 4 years prior to nephrotomy and decapsulation on the left kidney

W B white male, first presented himself for treatment November 6 1916, at the age of 17 years, with the follow

childhood.

When the patient was 13 years of age, he noticed that

and pads to protect the clothing

This condition continued for almost a year when a physician was consulted, who passed a metal sound into the urethra. It is probable, that at that time a urethral stricture was present and the involuntary dribbling was the overflow of retention. He was instructed to return probably for dilatation but did not do so. He again came under medical observation in July 1916 with the same symptoms, and was treated by urethral injection for three months without relief. During this time no attempt was made to explore the urethra

The patient first presented himself to us (Dr Leopold) for examination and treatment on November 6 1916 when the history above detailed was obtained. Abdominal examination revealed the bladder greatly distended extending to above the umbilicus. All attempts to pass catheters in the urethra were unavailing not even a [illegible] ed a trace of

[illegible] structure at [illegible] ow of reten [illegible] dvised The patient disappeared and returned 2 months later with the same symptoms, having had no treatment in the interim. Operation was again advised and urged. He was admitted to the Jewish Hospital on January 30 1917 and on January 31 a [illegible] a guide, was performed [illegible] charged February 19 1 [illegible] perineal wound healed [illegible] Subsequent treatment [illegible] igations were carried out

The patient did well until March 9, 1917 when he was seized with severe pain in the right kidney region and constitutional symptoms of infection. Examinations of Dr Ginsburg on March 12 revealed a mass completely filling the right hypochondrium dorsally extending ventrally to the linea alba, and below to the transverse umbilical line. Murphy's first percussion sign over the right renal region was positive. The right kidney was removed on March 14, 1917. The following are the notes made at time of operation. "Under ether anesthesia, the patient in the recumbent posture, a Mayo incision was made over the right lumbar region, dividing the muscles across their fibers. The kidney was exposed after removing the peri-renal fat, and was found to be almost 11 inches [illegible] and ol

[illegible] ill

[illegible] luu of pus.

From this time until September 12 1919, he remained in good health, able to do a full day's work, and had no symptoms. His phenolsulphonephthalein output in October 1917 was 50 per cent at the end of 2 hours in January 1918 it was 35 per cent, and in June 1919, it was 35 per cent. The blood pressure varied from 108 to 118 systolic. The left kidney was considerably enlarged and easily palpable. The urine continued to show pus.

On September 12 1919, the patient had an attack of left sided renal pain and a sudden rise of temperature. A diagnosis of pyelitis was made. There was prompt response to eliminative treatment and he was able to leave the hospital in 6 days.

URINARY OUTPUT AND BLOOD UREA ESTIMATION

BEFORE OPERATION

Date 1911	Drainage	Voided per urethram	Total (in ounces)	Blood urea (mgs. per 100 cm.)
Feb 20				
Feb 21				
Feb 22				
Feb 23				
Feb 24		1	1	24

AFTER OPERATION

Feb	Lost		Several oz. (estimated)	
Feb 1				
Feb 26	40		40	
Feb 27	17		45	31
Feb 28	47	9	56	
Mar	35		45	
Mar	47		50	
Mar 3	44	9	53	
Mar 4	4	36	41	
Mar 5		37	40	
Mar 6	29	7	36	
Mar 7		3	33	
Mar 8	3	34	37	4
Mar 9	1	47	48	
Mar 10	Tube removed	34	34	
Mar		47	47	
Mar 14		Not recorded		3

He was again referred to hospital On February 21 he

very quickly arrested, a small amount only being formed, and accumulating above the point of impaction of the calculus.

The kidney is enlarged owing to congestion and oedema of the organ which follow upon closure of the ureter and increased intrarenal pressure thereby produced and not because of being distended by accumulation of urine within it.

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obstacle be removed, continue, ultimately destroying the entire renal substance by a gradual aseptic process of atrophy if the kidney is not infected more rapidly by suppuration if it is infected.

We believe that in this case, each attack, clinically pyelitis, with its attendant anuria of varying duration, was in reality a renal colic caused by temporary blockage of the ureter assuming that such blockage might easily occur by extension from an obstinately chronic bladder infection.

In the three attacks preceding operation, the blockage was so temporary that the kidney did not become congested and oedematous, and shut down In the last attack, it did, either due to longer urethral block as indicated by the cystoscopic report the day preceding operation, or to summation of insult. At operation, the ureter

At the present time, the patient s 24 hour

been isolated, and a vaccine made which is being administered. The patient has resumed work and is apparently in very good condition.

The sequence of events in this case and the operative findings agree so closely with observations of Watson in his paper on anuria, that they are here briefly quoted

When the ureter is suddenly closed as in the case of calculus anuria, the urinary secretion is

was greatly thickened and collapsed but not obstructed There was no infection in the kidney

SUMMARY

1 A purulent urethritis acquired in some unknown manner at the age of 3 years and neglected, resulted in the formation of a urethral stricture which manifested itself symptomatically at the age of 13 years.

2 Operation for impermeable stricture at the age of 17 followed in 6 weeks by right sided nephrectomy for hydropyonephrosis

3 An interval of reasonably good health for 4 years, except for chronic cystitis, followed by 4 attacks of left renal colic, the last culminating in anuria in which 5 ounces of urine were voided in 100 hours, with the longest period of complete anuria, 35 hours

4. Impending uraemia with a blood urea of 75 milligrams immediately preceding operation

5 Nephrotomy and decapsulation in a case of single kidney, with prompt re-establishment of the normal urinary output and recovery

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AN IMPROVED NEEDLE FORCEPS

By Emmet A. Printy M.D., Chicago

THESE needle forceps were originally designed early in 1917, and the first model was described in the *Surgical Clinics of Chicago* October 1918 vol. II No 5 Various improvements have been made since then as can be seen by referring to the accompanying diagrams. The new instrument perfected in 1919 is of heavier and more solid construction the jaws are narrower and more tapered and a spring and hinge have been added

The forceps were originally made to use with straight needles, when doing gastro-intestinal suturing but the new model can also be used to hold curved needles, especially when suturing the skin. It can be kept on the thumb ready for instant use and does not have to be laid aside when tying sutures. In pulling the suture taut the thread should be *grasped* between the middle and ring fingers to prevent pulling out the needle. It may be used by the assistant as a needle-puller

The forceps have a definite field of usefulness, and after one becomes accustomed to them they are found most convenient. The needle can be held at any between the fingers with the added advantage that when suturing resistant tissue the needle can be held more firmly and there is not the danger of tearing or puncturing the gloves. The surgeon who has been accustomed to holding curved skin needles in his fingers upon trial finds that the forceps is most convenient and that he can obtain the same wrist action with it as with the needle in the fingers.



EDITORIALS

SURGERY, GYNECOLOGY AND OBSTETRICS

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PROLAPSE OF THE RECTUM

IT is very regrettable that the venerable term Prolapse of the Rectum is still much in vogue It retards progress and in a measure renders futile the search for an adequate treatment of a disease which, to put it mildly is nasty and extremely burdensome to the afflicted individual To the surgeon initiated into the true pathogenesis of the malady it is self-evident that prolapse of the rectum is only a variety of hernia and in consequence its treatment must also be based upon all those fundamental principles, which underlie the treatment of hernia in other parts of the body It is true that there exist certain very definite differences which render the problem an extremely difficult one and yet one not without interest and importance

The writer has definitely shown in previous publications that prolapse of the rectum is a hernia which makes its exit superiorly through the cul-de sac of Douglas and through that portion of the levator ani muscle through which the rectum normally escapes from the abdomen to the periphery this opening may therefore be termed the internal ring of the hernia and is analogous to the internal inguinal ring in an oblique inguinal hernia In the course of its development, the hernia first invaginates the anterior wall of the rectum into the lumen of the gut and when it has finally attained full size it escapes from the pelvis at the anus this may therefore be termed the external ring of the hernia, and i the analogue of the external inguinal ring in an inguinal hernia. Thus far prolapse of the rectum does not differ in its pathogenesis or pathology from any other hernia

The first notable difference and it i this feature which renders treatment difficult lies in the fact that prolapse of the rectum is an exquisite example of that subvariety of hernia which has received the name of sliding hernia It would lead me too far to describe at this place the pathology of a sliding hernia I will therefore merely point out that the important characteristics of this hernia are, first that it can occur only with viscera that are only partially covered by serosa, and second that the hernial contents, are not only hernial contents but are also used up in the formation of the sac. If prolapse of the rectum is now studied from this aspect of the subject it is readily seen that this particular form of hernia must be of the sliding variety because only the front of the rectum is covered by peritoneum

The second differential point and one which this hernia shares with sliding hernia in the inguinal region is the extreme difficulty in the operative treatment, and is further more accentuated by the fact that whatever operative measure may be undertaken for its treatment must be carried out at the extreme depth of the pelvis, enhanced by the addi

tional fact that, owing to the very presence of a hernial protrusion the pelvis is of unusual depth

The final and the most important difference between this and all other hernia is this that whereas as a rule in all other hernia the hernial coverings are of minor importance, and are ruthlessly discarded in prolapse of the rectum they are not only of prime importance but, so to say indispensable, because the rectum forms the most important covering of the hernia.

This pathogenesis of prolapse of the rectum can be readily proven at every operation which attacks the problem in a rational and radical manner It follows, therefore, that its cure must be based upon those principles which underlie the cure of a hernia in any other part of the body It follows also that no operation is to be thought of which attempts a cure by a plastic operation upon the rectum or by such operations which attempt a cure by suspension of the sigmoid flexure In fact no operation can be of value which does not take into consideration the hernial sac, which after all is the most important and underlying element in the pathogenesis of the malady Here however, we are confronted with the problem that the hernia is of the sliding variety, and that therefore it is impossible to extirpate the hernial sac, as we are accustomed to do in hernial operations After numerous failures in other directions the writer has finally arrived at the conclusion that even the extirpation of the sac is not the most important problem What is more important is its complete obliteration in such a manner, that hernial contents viz small intestines and omentum can no longer find their way into it The writer has, therefore, evolved the idea of a complete obliteration of the pelvis and he does this by circular sutures of an unabsorbable material (Pagenstecher s thread) In order to add additional support an attempt is made to grasp in the sutures also the subjacent pelvic fascia

It might be argued that this method of curing the hernia is flimsy, and hardly to be relied upon In reply it can be stated that the conviction is growing in the minds of surgeons that even in hernia in other parts of the body the adequate handling of the hernial sac is looked upon as one of the most important elements. Additional evidence is gained from the circumstance that the operation is nearly always curative At all events the pathogenesis of prolapse of the rectum as previously outlined is proven beyond peradventure and no operation, however ingenious can ever prove successful unless this pathogenesis is recognized A V Moschcowitz

INTRINSIC DERANGEMENT OF THE KNEE JOINT

If a patient dies from peritonitis following a clean abdominal operation his illness has been short. It is the end the patient is forever out of sight, and regrets are in vain As time goes on although not forgotten details are dimmed and reminders are less acute If however following the opening of a knee joint an infection occurs, the patient usually lives through weeks and months of suffering and is finally saved by free drainage with consequent ankylosis or by amputation to stamp around the remainder of his days a living blatant example of a surgical disaster

Before the days of Lister the knee joint was looked on as forbidden ground and this is a heritage that is hard to down The rare but unfortunate infection of the knee joint that has developed in our modern hospitals with the patient living and going through a heart rending convalescence, has but served

to keep alive this distrust of the knee joint as a proper field for surgery During the great war ample evidence was presented that the knee joint has an appreciable resistance to infection The mobilization advocated by Willems, when instituted early after proper cleaning of the wound and institution of drainage gave such astonishing results that we could no longer doubt That the late cases, when infection was deep in the synovia and capsule did not respond to drainage and motion, by no means disproves the claim If the surgical technique that is essential to all surgery is observed one need not fear explor ing the knee joint any more than any other closed serous cavity of the body

The semilunar cartilages rank first as a cause of mechanical derangements of the knee The English literature contains many re- ports, notably by Rutherford Morison and Sir Robert Jones, of large series of patients operated on, but the American literature is scanty This can be explained partly at least, by the fact that games such as rugby and soccer are participated in by a much larger number of persons than in America, and also by the fact that in the mines in the region of Newcastle where the condition is very common among the miners, the workers labor in low seams which makes it necessary for them to squat on their heels with knees flexed and feet everted a most favorable position for damage to the menisci The fact that the internal cartilage is more often damaged than the external can be explained by anatomic facts The internal cartilage is so firmly at tached to the internal capsule that when caught between the bones, if the force con tinues the cartilage will tear or fracture be- fore it is torn from its moorings.

Rutherford Morison has described in detail many types of fractures but the so-called bucket handle is probably the most com mon This specific tear is a longitudinal rip in the middle portion of the internal cartilage leaving the torn area attached at the anterior and posterior ends the loop thus formed slip- ping into the intercondylar notch Full extension is thereby prevented and the joint locked in slight flexion. A definite patholog ical condition as evidenced by a tear or fracture is almost invariably present when the derangement is due to the internal car tilage

The external semilunar cartilage at its periphery is loosely attached to the capsule and this fact permits the meniscus a certain mobility and allows it to glide out of harm s way If it is the cause of the derangement it usually is found crumpled up rather than torn and is more apt to prevent flexion than to limit extension The condition is usually a loose rather than a torn cartilage

The primary derangements should be treated conservatively but repeated lockings with periods of disability make it necessary to resort to surgery The X ray is of no value as these fibrocartilaginous menisci cast no shadows. The procedure of injecting the joint with oxygen, thus throwing the fibrocartilages in relief is too dangerous a procedure to warrant its use.

Loose osteocartilaginous bodies are also a cause of mechanical derangement of the knee but the symptoms are more transient and the disability less than when the menisci are at fault In numbers they range from one or two up into the hundreds Usually the patient has palpated them and often is able to force them out where the surgeon can also feel them They are readily shown by the X ray Not infrequently both joints are involved They are of chief interest from the view point of etiology As a primary premise it may be accepted that trauma, direct or indirect is a factor but not the sole factor in

their production They may be grouped under three divisions. They may arise from the internal condyle just anterior to the insertion of the posterior ligament. A satisfactory explanation of this peculiar condition, seen only in the knee joint, has not been advanced, but Koenig in 1887, offered the theory that it was due to blockage of an end artery and called the condition "osteochondritis dissecans" They may arise incidental to osteoarthritis The marginal osteophytes or ec chondroses become chipped off and wander freely about the joint cavity and increase in size obtaining their nourishment from the joint fluid Occasionally the synovial membrane undergoes a peculiar change becoming thick and pleated, forming bulbs which become osteocartilaginous on the tips and as they increase in size, drop off and migrate as free bodies They take nourishment from the joint fluid, further increase in size, and may be so numerous that in palpating the knee one is reminded of a sac of marbles This condition is called "osteochondromatosis," and is not confined to the knee joint, but may be found in the elbow or shoulder joint. It suggests in some ways a benign neoplasm Osteocartilaginous bodies rarely arise from the tibia or patella. Loose foreign bodies of extrinsic origin are of very rare occurrence in civil practice.

The incisions to be used in the removal of the causes of mechanical derangement are of importance because the joint cavity is not easily explored When one of the semilunar cartilages is to be removed, either the internal anterolateral or the external anterolateral are to be preferred to any other When a thorough search of the anterior compartment of the knee joint is to be made, the longitudinal split patella incision is the incision of choice When the bodies to be removed are in the posterior compartment the posterior, internal lateral or the posterior external lateral incisions made with the knee flexed to a right angle afford ready access to a rather inaccessible region and even a fair degree of opportunity for visual inspection

MELVIN S HENDERSON

GLAUCOMA

IN glaucoma we are dealing not with a disease entity but rather with a syndrome the chief feature of which is increased intra-ocular pressure

The question "What controls the intake and outflow of fluids in the eyeball and thus preserves the normal intraocular pressure ' has not yet been satisfactorily answered Until this is known we are not in a position to understand why the pressure is increased

A great deal of evidence has been offered to show that this increase of pressure has an anatomic basis and that it results from a blocking of the lymph circulation through the spaces of Fontana that lie in the pectinate ligament at the sclerocorneal junction Most of the investigations of students of the subject, such as Weber Knies, Priestley Smith and Henderson are along this anatomic line

Others maintain that the cause must lie deeper and may be looked for in increased secretion of fluids or of altered secretion of fluids by the ciliary processes, and that such increased or altered secretion may be influenced by degenerative changes in the structures of the eye, or may be the result of disordered metabolism Whatever may be the cause of the increased intra-ocular pressure it is generally recognized that this is the dominant feature of the condition, the most immediate factor in the impairment of the function of the eye, and the one that best accounts for the clinical manifestations of glaucoma. It is, therefore, the one against

which therapeutic attack has been directed on the assumption that if there is no increased intra-ocular pressure there is no glaucoma

The discovery by von Graefe in the middle of the last century that iridectomy will reduce the tension of a glaucomatous eye has been the means of preventing great suffering and saving the sight of many who without it would have become blind

The value of this operation is seen particularly in cases of the acute or congestive type in which the anterior chamber is shallow and the root of the iris tends to block the filtration angle. But often the glaucomatous condition persists or recurs after such operation however skillfully performed and surgeons have found it necessary to resort to other means to promote and facilitate drainage from the eye to maintain the proper pressure equilibrium

Particularly is this the case in the so-called chronic or non-congestive types of glaucoma in some of which the pressure is not greatly increased but which may go on rather slowly or insidiously to contraction of the visual fields and ultimate blindness In these cases ophthalmologists use myotics such as eserin or pilocarpin hoping by the contraction of the pupil to put the iris on the stretch and draw it away from the filtration angle Also by this measure the spaces of the iris are opened up and are better able to absorb fluid from the anterior chamber

If this treatment with myotics combined with general measures suffices to keep the intra-ocular pressure within normal limits, and the visual fields from contracting operative treatment is by some regarded as unnecessary But too frequently this proves to be false security and the tension remains increased and operation becomes necessary It has been found that in chronic cases iridectomy is not as valuable as in those of the acute or congestive type

Various methods have been proposed and practised for securing artificial drainage of fluids from the eye and thus lowering its pressure and the most important of these aim to accomplish the result by some form of sclerectomy which on healing is supposed to leave a loose meshed scar the filtering cicatrix through which the fluids of the eye will filter away into the submucous cellular tissue of the conjunctiva

In this class of operations are the sclerectomies of LaGrange (combined with iridectomy) Herbert, Holth and the trephining operations of Fergus and Elliot In another class of operations, the attempt is made to insure a cicatrix more permeable to fluids by incarcerating a portion of the iris in the wound of the sclera this being covered by the conjunctiva Such are the operations proposed by Herbert Holth and elaborated by Borthen in the operation of iridotasis.

The operation of cyclodialysis, separation of the ciliary body from its attachment to the sclera so that fluids may pass from the anterior chamber into the subchoroidal spaces excited some attention years ago but is not practised much now

Quite recently a new thought has been advanced by Curran that in glaucoma fluids cannot pass readily enough from the posterior into the anterior chamber because of the close coaptation of the surface of the iris to the anterior surface of the lens. He endeavors to remedy this by a small iridotomy near the root of the iris, through this small opening the equilibrium of pressure between the posterior and anterior chambers can be reestablished

Indeed the operations that have been proposed for this deplorable condition are so numerous as to indicate that the perfect one has not yet been devised

WILLIAM H WILDER

TRANSACTIONS OF SOCIETIES

CHICAGO GYNECOLOGICAL SOCIETY

REGULAR MEETING HELD NOVEMBER 18, 1921, DR W C DANFORTH, PRESIDING

PRIMARY CARCINOMA OF THE FALLOPIAN TUBE

DR JOSEPH L. BAER Mrs. H age 53 entered the Michael Reese Hospital on September 27 complaining of backache, frequent urination, constipation, and weakness, which had been present for the last 4 years and had been increasing in severity General physical examination was negative except for a moderate, bilateral, cervical adenopathy Bimanual examination showed the pelvic inlet to be filled by a globular mass of grape fruit size completely obliterating the cul-de-sac of Douglas The uterus was crowded against the left superior pubic ramus. Pre-operation diagnosis solid right ovarian tumor

At operation the left tube and ovary were found normal. The uterus was atrophic. The right tube was bound down to a hard, white mass the size of a small grape fruit which was fixed by firm adhesions to the pouch of Douglas and to the posterior abdominal wall. The left tube and ovary were left *in situ* and the tumor, uterus, right ovary and tube removed. The removal of the tumor was quite difficult, there was considerable bleeding and a large denuded area was left in the pelvis. The sigmoid was used to block off the pelvis. Microscopic diagnosis made by Dr Oscar Schultz primary carcinoma of fallopian tube. The patient made an uneventful recovery and left the hospital in 14 days.

DERMOID CYST EXPELLED FROM RECTUM DURING LABOR

Mrs. F age 25 III para, admitted in labor Patient had had one normal and one instrumental delivery After the cervix had been completely dilated for 1¼ hours and no progress was evident the head being deeply engaged forceps delivery was done While extracting the head a free mass the size of a man s fist, fell out through the anus No rectal bleeding followed. The puerperium was entirely uneventful without any temperature elevation The condition was encountered in a rather difficult forceps extraction and after getting the head down on the pelvic floor I thought that there would be no further trouble, and went ahead with the extraction. The anus began to dilate when to my horror the whole rectal wall apparently began to show and prolapse I had visions of a complete avulsion of the rectum prolapsing through the sphincter, but the perineum was intact, so I went ahead and the advancing baby's head continued to push this mass through the anal sphincter Finally it proved to be a smooth-surfaced tumor which in another moment popped out of the anal opening fully detached and free It was a tumor of man s fist size, which proved to be a dermoid cyst with a little roughened surface at one point which was evidently the place of its attachment, somewhere The patient made a normal recovery without evidence of traumatism along the lower bowel. The problem arises whence the dermoid Dr Schultz finds that the microscopic picture bears a resemblance to a dermoid of the ovary Whether this was erosion into the intestinal canal higher up or whether it presented an embryological cyst of the recto-vaginal septum I do not know I came into the case when the head of the child was deeply engaged Bimanually it was not revealed there was no rectal prominence at all comparable to this apple-sized mass

This complication is unique in my experience and in my reading nor have I found anyone in the society or outside of it who ever encountered it before. Dr L E Frankenthal has called my attention to a case reported in a recent number of the *Zentralblatt fuer Gynaekologie* in which a fixed sacrococcygeal dermoid was an obstacle to delivery and was surgically removed to permit labor to be completed

DISTURBANCE OF OVARIAN SECRETION A PROBABLE CAUSE OF DEVELOPMENT OF HÆMORRHAGIC TENDENCY

DR ARTHUR H CURTIS Very recently I operated upon a young woman of about 30 who had two chocolate-colored cysts of the ovary one the size of a fist the other four or five times as large. There was almost no ovarian tissue left in the cortex of these cysts This patient had been under the care of Dr Oliver S Ormsby for more than 7 years. Every time the cutaneous surfaces of her body were bruised ever so slightly she developed a hæmorrhagic area at times as large as a saucer

The question arises as to whether the disturbed secretion of the ovary is an essential factor in the

development of the hæmorrhagic tendency I wish to ask whether other members have encountered similar dyscrasias which might be ascribed to disturbances of the ovaries

COMPLETELY CALCIFIED OVARY

This specimen was taken from a colored woman of about 44 years The patient had a mass of fibroids the size of a child s head On rectal examination, the

entirely of bone was hollow in the cent r com municated with the large bowel and was filled with débris

DIFFUSE ADENOMYOMATOSIS OF THE UTERUS

This second specimen shows a diffuse adenomyomatous of the uterus The uterus is about three times the normal size Sections made at random invariably yield acini of glandular tissue

FOUR CASES OF NEPHRECTOMY FOR VARIOUS LESIONS

Dr W C Danforth These four cases are shown, not because any of them represents anything of outstanding interest, but merely to emphasize the fact that in any service in which numbers of women are treated there are found at frequent intervals lesions of the urinary tract and that it is the part of wisdom to be on the look-out for urinary pathology

The first specimen is an enormous pyonephrosis

omy for drainage to decrease its size, obtaining a considerable amount of purulent material of syrupy consistence from which we were not able to obtain any growth upon culture Six weeks later nephrectomy resulted in obtaining this very large kidney which was so densely adherent that in excising it, a hole was torn in the diaphram which was repaired immediately without apparently influencing the convalescence

The second specimen is a large tubercular kidney containing many pus cavities It was removed from a woman who up to the time she was referred to me for diagnosis, had presented no symptoms whatever except a slight increase in frequency of urination which had been refractory to ordinary treatments.

sumed therefore must come from the left kidney Nephrectomy was done by Dr William R Parkes at whose request I did the cystoscopy

The third specimen comes from an old woman who came to the out patient department of the hospital because of frequent urination Pelvic examination was negative and she was sent into the gynecological service for cystoscopy the mass in the left kidney having been overlooked until that time She was

Adams Ten years later nephrotomy was done at which time two large stones were removed and the kidney drained When she came to the hospital she had a large pyonephrosis and X ray showed the presence of two enormous stones We have therefore, a formation of enormous stones in the same kidney in the same individual three separate times in 24 years I have had one other instance of formation of a stone of walnut size one year after removal of a stone from the same kidney

CHILDBIRTH—PRIMITIVE VERSUS MODERN

Dr C Henry Davis, Milwaukee, Wisconsin, read a paper entitled "Childbirth, Primitive vs. Modern" The paper was followed by a lantern demonstration showing labor scenes from Dr Englemann s *Labor among Primitive Peoples* and others to demonstrate modern delivery room technique as employed by the writer (See p 636)

DISCUSSION

Dr De Lee I think that I ought to say a word or two on certain points, upon which I have always laid the greatest stress. My book distinctly instructs

aseptic I consider this advice very important.

sheeting to the same degree of magnitude that will enable you to see a bacterium or coccus, you will see that it looks very much like chicken wire and a germ will go through the interstices of the cloth as a fly will go through the chicken wire You do not need a picture to prove that And it is especially true if there is only one or possibly two layers of cloth

Now if those two layers of cloth are wet then the capillary effect, or capillarity will draw the germs through from the infected surfaces Therefore, the

coverings of the legs, although sterile when put on are not considered aseptic, and the only part that may be touched with safety is the part immediately around the vulva, and the sterile towel over the belly which is frequently changed

Regarding the covering of the anus we know that during delivery, the discharges from the anus some times come out with great force and if you put one or two layers of sheeting over that region, and then expect to handle the surface you are running great danger of contamination from the anal discharges. Even with impervious rubber sheeting it is dangerous

I have tried every method to protect the field against infection from the anus and find none that is entirely satisfactory I believe that the best method is to watch the anus constantly and to catch the discharges.

The society may remember I have always held that childbirth is a pathological function. No one in his right mind would contend that pregnancy is a dis ease, but no one can deny that pregnancy and labor leave changes in the woman, and often the child that are distinctly pathogenic. They are pathogenic and therefore pathological, and, in order that the people the medical profession and our legislators should give the science and art of obstetrics its proper place it is necessary that every one should recognize the pathological dignity of this function.

That obstetrics has so far not attained the place in the general esteem it deserves may be learned from the paper of Dr Davis. In 1835 Ramsbotham complained that he was not allowed to become a fel low
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of extreme courtesy to him because he was such a good and much sought after obstetrician Ramsbotham was invited to witness a cæsarean section performed by one of the famous London surgeons. Fate would have it that the surgeon failed in his effort to deliver the child and he had to call on Ramsbotham to turn and deliver it, whereupon the surgeon completed the operation.

Even today the obstetrician does not rank with the surgeon in the minds of the public nor will he until the full pathological dignity of obstetrics is recognized.

Dr Rudolph W Holmes Dr Davis mentioned that Philadelphia was the first American city to have obstetric teaching, which is true as far as systematic instruction is concerned, though the first full professor of obstetrics was Dr Tennant of King's Col lege, now Columbia College Buffalo has the credit
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woman who had lodged with the janitor's family in the college building Professor White was severely arraigned for the *indecent* exposure by members of the profession and the daily press. In the suit for libel instituted by White the defense had medical witnesses who maintained that no knowledge was acquired by the students from the exhibition, that the time for a doctor to learn obstetrics practically was when he entered practice One testified that students watching a hen lay an egg could learn as much as watching the head come over the perineum.

Another thing Doctor Davis made the statement that the sensorium of the modern obstet ric woman has changed over a former period I cannot accede to that After reading the past lit erature covering obstetrics these last three or four centuries I doubt that a critical reading can substantiate the statement Going back to *Genesis* we find that women bring forth their young in tra vail and pain travail is not merely pain but ex cruciating pain When we come down to more modern times all the dissertations pro and con con cerning the use of chloroform in labor, by Simpson shows that in spite of what one or the other said women suffered severely in the throes of labor You know that Hodge and Meigs combatted the use of anæsthesia at that time by the bald statement that the pains of labor were physiological and therefore had no necessity for their relief The fact that Queen Victoria the titular head of the Church of England had chloroform employed when princess Charlotte was born did more to popularize the use of the drug than any other single factor In more recent times, nothing has been written for or against the use of twilight sleep or the really scientific employment of nitrous oxide-oxygen but what is merely paraphrasing the acrimonious debate centering around Simpson in 1847 when he began the use of chloroform. It hurts now to have a baby and history shows that it always has done so Some women have more fortitude than others but pain is there nevertheless

Further I question if there has been any structur al change in the anatomy of women going back to the beginning of time. I am not referring to changes incident to disease as rickets or joint luxations, but purely in biological development Of course stat ure of different peoples show marked deviations of

The rite of circumcision has been practiced for thousands of years, and yet the rite has had no influence on the biological development of the prepuce it is just as redundant today as it ever was

Dr Taussig recently informed me that there is nothing to show that the conformation, or development of the hymen has altered so far back as knowl edge goes.

With the two above analogies I believe there is no scintilla of truth in the too oft repeated assertion that women today have more difficulty or more pain in labor than formerly If we judge of normal women not those suffering from acquired distor tions from disease

Dr. Thompson I would like to add a few remarks in regard to obstetrics among primitive people I

have had some experience in examining the women among the Ojibway Indians in northern Ontario simply stop and have the baby by the side of the lake, put it in the canoe paddle along and join the others Injuries such as are known among the civilized people are scarcely heard of among those primitive people.

The mixed bloods are the ones that have the obstetrical injuries and diseases When I used to go north on my summer journeys, an old halfbreed woman who was the Godmother or mid wife to practically all the tribe in that country used to ask me every season if I would see a lot of the poor women that she had gotten together knowing that I was full blooded Indians It has always been the case that the injuries were among the half breeds, but the full bloods were peculiarly free and they were much more healthy and seemed to recover much more quickly after lying-in

DR CAREY I should think it would be objection very nicely in emergency cases but if there is anything to be done the sheet becomes contaminated with fecal matter and moisture from whatever source and as the patient moves the knees up and perspire freely and bacteria may be forced with neal area is cleaned the pores of the skin are sealed with sterile glycerine as a rule but vaseline or liquid soap may be used. The abdomen is covered with a the vaginal opening It does not come in contact with the perineum at this time A primary posterolateral episiotomy is now made. The sphincter ani is already dilated by rectal examination I favor episiotomy for most primiparæ and multiparæ who have not been neglected following former labors Formerly I used the medium episiotomy but following three complete tears, one with a persistent posterior and two with rather large aftercoming heads concluded it was safer to direct the cut somewhat to the left side of the sphincter The complete tears were repaired at once with perfect results in two cases and fair in the third.

My patients are given a light anæsthesia with repaired under a gas-ether anæsthesia I bury plain catgut and close the mucous membrane and skin with chromic catgut. In a few cases black silk is used for the skin. When care is used to avoid dead spaces and strangulation of tissue from drawing the sutures too tight there should be a perfect restoration of the perineum.

Could Dr De Lee or Dr Carey see a patient delivered under obstetrical analgesia with this technique I believe they would agree that when the patient is quietly working according to directions,

DR BAER Just a word in defense of the lateral position for delivery which is our routine at the Michael Reese Hospital We believe that exposure of the anal field lends itself much more readily to protection of the birth canal than any attempt at burying the anal orifice under sheeting or packing with cotton, the discharges from the anus down under the buttocks Furthermore, we believe that we are better able to watch and guard the perineum and control and manipulate the head with lateral posture than in the dorsal position as advocated by Dr Davis

DR. E CAREY I think, in defense of Dr Davis statement as to the more difficult labors in the present day it is known that the mixing of the nationalities will increase the size of the head It has been definitely shown that the Japanese who are about the only pure blooded race left in the world very seldom if ever have any laceration The pure blooded Marquesans also have very little difficulty as a rule. They usually take the baby immediately down to the river and wash it as soon as delivered; afterward plunging in for a swim themselves.

Regarding sheeting or the use of emergency draping, as Dr Davis describes, I have found that it goes

my changes in technique are not open to the question they have raised

With Dr Holmes, I agree that childbirth has always been accomplished after more or less suffering Even the lower animals show mute evidence of suffering during parturition Yet the modern woman through mixing of races has a harder time with an increased amount of dystocia. Dr Thompson has emphasized this from his observations of the North

pain

HYPEREMESIS GRAVIDARUM

DR. CHARLES E. PADDOCK read a paper entitled "Hyperemesis Gravidarum (See p 633)

DISCUSSION

DR J L WILLIAMS A quantitative study of the chemistry of the blood in hyperemesis gravidarum reveals a marked increase in the concentration of uric acid In addition to the seven patients previously reported before this Society there are five oth

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per 100 cubic centimeters during the period of maximum toxemia

was 10 15 to 4.1

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dropped to normal after delivery and in one which Dr Paddock has reported tonight the amount of uric acid in the blood returned to normal following the treatment as outlined although the concentration in the blood of this patient was the lowest of the group One of these patients whose symptoms were very pronounced had a marked retention of non-protein nitrogen substances other than uric acid in the blood At the period of maximum toxemia in this patient the blood urea nitrogen was 107 75 the total non protein nitrogen 147-4 the uric acid 10 15 the creatinine 3 8 milligrams per 100 cubic centimeters. After therapeutic abortion was performed, the values for all of these substances promptly returned to normal In another patient the uric acid and other waste nitrogen products were markedly diminished several hours after the intravenous injection of corpus luteum extract

The outstanding fact that delivery or operative removal of the uterine contents is followed by a return to normal of the concentration of the uric acid of the blood suggests the possibility that by absorption the amniotic fluid may be the source of the increased amount of uric acid in the maternal blood. The amniotic fluid of the patient whose blood con

rate nitrogen,

than had the

In all patients with true pernicious vomiting there is a moderate acidosis as evidenced by the depression of the alkali reserve below the level for normal pregnancy In starvation there is said to be an acidosis clinically I have examined the blood of one patient dying of starvation caused by duodenal carcinoma and it contained only a moderate increase in waste nitrogen and 4 milligrams of uric acid per 100 cubic centimeters

DR MILTON M PORTIS I have had a very limited experience in the treatment of hyperemesis gravidarum. I have seen an occasional case and the particular case that Dr Paddock mentioned is one that I followed more closely in detail. In my work of course I have seen a great many cases of vomiting The vomiting in some is due to intestinal obstruction, and they are given immediate surgical treatment But in the majority of cases the vomiting is not due to a surgical condition and these it has been my lot to treat

In the early days we used rectal alimentation but it was entirely unsatisfactory after the first few days. The bowel does not absorb but a very few things It will take water in quantities it will take glucose and alcohol But bevond that if you are at all interested in studying your cases given nutrient enemata you will find that you get back practically all you put in the bowel

We worked a good many years in trying to get around this but without success When Einhorn brought out his duodenal tube in 1909 I, for one

however very difficult. Einhorn fed with a little syringe that sometimes worked and sometimes did not At last I modified it and tonight I will show you an improvement I have been using for the past 7 or 8 years that I think is a better type for feeding It is simplified very much from the feeding standpoint and from the nursing standpoint It is not a very difficult thing to learn, but it does require some good technique. There are a lot of tricks you have to learn to be entirely successful The patient doesn t like it and you have to get the patient s confidence. But all the patients when they get the prompt relief from the vomiting and nausea and begin to feel that they are being fed would rather have the tube down than to have it out.

I remember the patient that Dr Paddock mentioned, who asked to have the tube put back in again when her symptoms returned And I have known that to be true in a number of cases.

I won t take up any time in talking about the various theories of the etiology of hyperemesis gravidarum There is no doubt in my mind that there is a great big psychic element in this trouble I am convinced of that from the type of patients we see, and from the results obtained in giving the patient something out of the ordinary But as Dr Williams has said, there is a definite blood change found in a number of cases and that the patient can

of food Whether this toxic picture is due to the demonstrated blood changes I do not know but the fact remains that we lose patients who are not pregnant if we allow them to go on with just the type of thing you see in pregnancy

I remember very well in the days before we had the duodenal tube a healthy young woman of 16 years, with a peptic ulcer who went on vomiting in spite of all the measures we used I have never forgotten the desperate days we had in trying to feed that girl and in trying to keep her from dying In her case the urine was perfectly normal at the start

With your permission I will ask Dr Sidney Portis to demonstrate the apparatus we use and explain the details

Dr Sidney Portis For ordinary purposes of inserting the duodenal tube a patient must have a

olive way beyond the duodenum. This little stop cock is closed and if the patient has an empty space from an extracted tooth the tube is fastened into it

ing with the aid of a large Luer syringe a small amount of air is put into the tube in order to expel small plugs of mucus Then by means of gentle suction the duodenal contents are aspirated.

If the tube is in the duodenum or beyond a light yellow to whitish fluid is returned which shows an increased viscosity when dripping from the tip of the syringe If the fluid comes back very readily and it is thin and contains mucus, it has been my experience that it is in the stomach The duodenal contents are much thicker and usually bile-stained If one is still not certain the tube is in the duodenum, the patient may swallow a small amount of milk and if the milk does not return the olive is not in the stomach.

every 2 hours

patient

Dr. Milton M Portis I am glad Dr Bacon

comes into the stomach it spreads over such a large surface or area that you can determine where it is without question

I did not want to give the impression and I do not think my brother did that there is any discrimination as to what should go through that tube You can put in anything you want to. Give as much of the carbohydrates as you choose or glucose or anything else you want All types of medication

Dr Dr Lee A year ago Dr Paddock told me about the duodenal tube feeding and since then I have used it in three instances In two of the cases

ond the man con- ie of the tube so us that

we could introduce large amounts of fluids by means of the tube but in spite of the introduction

believe that the tube was in the duodenum.

it beyond the pylorus

Nevertheless I doubt not that this is going to be a very great addition to our future handling of ordinary vomiting in pregnancy It has the double advantage of the psychic influence and also the supplying of food, but the toxic cases will go on to death in spite of these.

I had one very sad experience lately in which we fed the woman for several weeks We were under the impression that she was improving because her vomiting was reduced, and she showed signs of gaining She had plenty of liquid and her weight was not being very much reduced. Her blood picture on several instances was normal, and yet the toxemia continued in spite of these very favorable signs. All of a sudden she took a turn for the worse, developed an acute polyneuritis and died in 3 days Her alkali reserve was good her water balance good, and she got enough calories to keep up strength and they were sufficient to keep her

with the vomiting upon the introduction of the tube, or whether the nausea persisted with the use of the tube.

I fear that we are liable to make certain deductions from the blood chemistry in these conditions which are not justified

Dr Williams has mentioned that in these cases of pernicious vomiting the uric acid concentration is high He also stated that in a case or two where the pregnancy was interrupted, the uric acid concentration of the amniotic fluid was also high and suggests that there is a relationship between these two conditions. Dr Williams also mentioned that in the cases of Dr Paddock s in which the patients were relieved by the use of the duodenal tube, the uric acid concentration of the blood fell to normal. Dr Portis states that in his cases of neurotic vomiting where there is no pregnancy at all, the uric acid concentration is also high, while Dr Williams states that in a case dying from stricture of the duodenum the uric acid concentration was unchanged

Now I deduct from these facts that the uric acid concentration of the blood may be secondary instead of a primary condition, and is dependent upon the fact the patient is in a starving condition from vomiting and that the acidosis and blood chemistry picture are dependent upon this fact and not upon the fact that the patient is suffering from an intoxication of pregnancy *per se* If a patient comes almost to the point of death from vomiting when she is not pregnant and has the same blood chemistry as a patient with hyperemesis gravidarum *in extremis* we certainly could not say that a placental condition produced the uric acid concentration. If the blood chemistry is altered we would also expect all the fluids of the body to be altered and therefore it seems natural to expect that the amniotic fluid would also have a high uric acid concentration. I am not sure, but I suggest that we may learn that the blood picture is a condition secondary to the vomiting instead of being associated with the cause of the pernicious vomiting

Not of scientific importance, but of the very highest clinical importance is the fact that for the last few years the only cases of hyperemesis gravidarum that I have seen have been in doctor's wives and in nurses

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in

and on that point I want to bring out a feature in my patient s history Her mother had been pregnant six times and in each case there was a very severe case of hyperemesis gravidarum

Dr Bacon We cannot get away from the discussion of the cause of hyperemesis gravidarum but it is questionable of course, whether the chemical study of the blood may lead us to some better *knowledge of it than we have now A few years* ago J Whitridge Williams thought that he could determine the toxic cases by finding the ammonia coefficient. Now we know that a high ammonia coefficient may result from starvation.

And so with the present condition of the etiology it is evident that besides treating the patient psychically and symptomatically the one thing to do is to feed the patient It is unfortunate that we can not succeed in feeding the patient by rectum in every case No doubt very much can be done by proper rectum feeding by the use of only those substances that are absorbed from the rectum such as glucose and alcohol and not trying anything else, and by proper treatment of the rectum and by using local sedatives if necessary

But if we can by the use of the duodenal tube get liquids and even those two foods, glucose and alcohol, into the system we are doing very much and we do not have to bother for a few days at least, with milk or anything else and it seems to me that it would be better as a point of technique to adhere simply to foods that would not stop up the tube.

used the duodenal tube a good deal and he informs me that he succeeds very often when the introduction of the tube is difficult by using orthoform in the stomach and producing a partial anæsthesia which assists in the introduction of the tube Moreover he also determines the presence of the tube by the use of the flouroscope and I suppose that would be an important part of the technique.

etiological view point it needs must fall in its ultimate aim

Lockhead and Cramer as far back as 1908, pointed out that one of the chief functions of the placenta is to store glycogen and that most of the fats formed in the foetus are derived from that source

Mottram in 1909 found a glycogen deficiency in the livers of ill-nourished pregnant animals and in 1921 in the *Lancet* Harding states that the causative factor in vomiting of pregnancy is a lack of sufficient glycogen in the liver or in short a carbohydrate deficiency which he has proved results in a fatty infiltration of that organ

acidosis Silberstein, of Munich in 1912 and

noted that the liability of vomiting in postoperative cases was increased if acetone were present in the urine

Constipation tends further to embarrass the liver by adding more toxins and Alvarez, in 1919 has shown by X ray that plugging of the lower bowel produces reverse peristaltic waves that reach even to the stomach and oesophagus

Now in order that our treatment in vomiting of pregnancy may be founded on rational principles, we must consider primarily a carbohydrate deficiency an acetonemia an acidosis, and constipation Harding has shown that fatty infiltration of the liver in laboratory animals has followed relatively short periods of starvation and considers this of par amount importance.

liver is greatest

Therefore the most logical treatment it would seem, would be to supply an abundance of carbohydrates in the diet several times a day neutralize the acid condition evident by urinalysis and correct the constipation This I have endeavored to do in my cases with signal success

DR McKEE Dr Paddock did not mention the severe vomiting that continued throughout the pregnancy in the patient who happened to be my wife. The vomiting commenced 10 days before the first period was missed That answers in part Dr Heaney's suggestions as to the neurotic element Another point the nausea was not relieved with the relief from vomiting in this case It was the last thing to disappear However at the present time the more frequently the patient eats the more comfortable she is and she is in better condition now than she was during the first pregnancy In other words since she has recovered from this severe siege she has continued to improve At the time of delivery the patient weighed 90 pounds but soon reached 145 pounds, showing how rapidly she recovered I do not know whether it has any bearing whatsoever on the subject but at present the patient voluntarily chooses sweet foods and digests candy with the greatest degree of comfort.

DR. PADDOCK I hope I made it clear that the duodenal tube is of great benefit in the treatment of many cases of hyperemesis gravidarum perhaps not in every case With the tube well into the duodenum there will be no vomiting and I am sure that in the case reported by Dr De Lee the tube had not passed the pylorus

There are undoubtedly cases of severe vomiting in pregnancy which only the termination of the pregnancy will stop and possibly that treatment will not succeed Loss of weight with dehydration of the tissues is a warning sufficient to put the physician upon his guard that the case is becoming a very serious one Do not wait until all other treatment has failed and the patient is in a desperate condition. The tube can be retained for days or weeks with no discomfort to her Dr Portis has told you how simple it is to pass the tube and the kind of nourishment to be passed through the tube

To one of my patients we gave during the first 24 hours 86 ounces of nourishment mostly peptonized milk and glucose The next day she took 108 ounces of the same with the addition of egg

Every recognized treatment for hyperemesis gravidarum has been tried in each of my reported cases

patients as a matter of conviction that I am sure had I done so I would have lost her Even when the cause for the vomiting has been removed, as for instance the correction of a retroverted gravid uterus or any mechanical irritation removed duodenal feeding may be of great service in quickly overcoming the dehydration and starvation

I am sure we have in the use of this agent a valuable addition to the other means of treating our cases of severe vomiting in pregnancy

BOOK REVIEWS

A CRITIQUE OF NEW BOOKS IN GYNECOLOGY AND OBSTETRICS

BY GEORGE GELLHORN M.D F.A.C.S., SAINT LOUIS

HERO worship is, in a way a wholesome thing It inspires the young and it stimulates the mature As a nation, we Americans have all too little of it. We criticize our leaders while they are alive, and we forget them as soon as they are dead Washington and Lincoln are notable exceptions but who thinks of Hamilton or Grant, who speaks of the man who invented the cotton gin who built the first locomotive who constructed the first steamboat? Among physicians the memory of medical heroes is pitifully short lived Since we have transferred our instruction to students almost altogether from the lecture room to the bed side, there is no time to dwell on the evolution of our science and where is there in our universities a chair for teaching the history of medicine? It would be an interesting but probably a disappointing experiment to inquire from a group of physicians what Ambroise Paré had done to achieve immortality what we owe to a Harvey a Virchow a Koch a Pasteur why mankind is in debt to Oliver Wendell Holmes and Ignaz Semmelweis. In the absence of systematic teaching of history in medical schools essays or books on historical subjects fill a real need and should receive a hearty welcome This applies pre-eminently to a new book by Schachner which is devoted to one of the greatest among our medical heroes, to Ephraim McDowell,[1] whom America proudly shares with the world The author has set himself the task of protecting from indifference and oblivion the memory of that courageous practitioner in the small frontier town in Kentucky who in 1809 performed the first ovariotomy and thereby ushered in a new era of surgery If we consider that the most brilliant exhibition of surgical skill and judgment of today rests upon the cornerstone daringly laid by McDowell more than a hundred years ago we must needs applaud the author's desire to establish in the hearts of the medical profession a factor of the investigation been a labor of love, have enabled the author to present the life and work of his hero in greater completeness than it has ever been attempted Sidelights upon general and medical conditions of the times prove to be most interesting and a separate chapter devoted to Margaret Crawford, the heroine of that great historical event appeals to us as a highly sympathetic document

The make-up of the book is excellent and adds its share to the prominent place the work should occupy both in public and private libraries.

DO American physicians fully realize that the modern art of medical illustrating originated in this country and in our own days? Art there was—highest, noblest art—when Vesalius Albrecht Duerer and Rembrandt and their contemporaries drew or etched or painted anatomical subjects But in the centuries following less and less attention was given to the subject of medical pictures until the task of illustrating medical works was, with but occasional exceptions left to mediocre talent and we have only to remember our text books as late as 1900 to recognize how insignificant a part pictorial art played in the education of the student. A very important change took place in 1899 when Howard Kelly's *Operative Gynecology* appeared adorned with illustrations of an heretofore unknown excellence The illustrator Max Broedel, a young art student recently from Leipzig brought to his

a few other artists and excelled by none. Another significant development occurred recently and likewise in this country when a chair of the relationship of Art to Medicine was endowed at Johns Hopkins University and it is there that Max Broedel the first incumbent of this new professorship is conducting a training school for competent medical artists

All this of course, is not a book review Rather it is a trend of thought which is called forth by reading a French manual of obstetrics[2] which by its fourth edition has sufficiently demonstrated its

we can not insist too strongly on the importance of instructive pictures as an effective aid to the spoken or printed word.

[1] Ephraim McDowell. "Father of Ovariotomy and Founder of Abdominal Surgery." By August Schachner M.D F.A.C.S. Philadelphia and London J. B. Lippincott Co 1911

[2] Elements d'Obstétrique By Dr V. Waffich. 4th ed. Paris: Masson et Cie 1912.

THE intimate relationship between gynecology and obstetrics is well demonstrated in a book[1] which has just come to us from England Fairbairn with the help of numerous contributors presents the entire subject of obstetrics and gynecology in *one* rather large volume Of these contributors, there are quite a few whose names are well known and honored among us—Ballantyne, for instance and Eden Kerr Whitehouse Berkeley Bonney Jellett, Lockyer—and we are glad to greet the others feeling from their contributions that the future of our specialty in England is safe in their hands. Where so many writers co-operate, it is impossible to avoid a certain overlapping and

Reproductive Organs contains anatomy and physiology and forms the common basis for the

as contrasted with the extreme modernity of gyne

subheadings. It is very pleasing to note that the

cology in relation to Public Health and Industry is an expression of the tendency especially marked in recent years, to think in terms of the community, and not of the individual patient alone Some of the subtitles, such as "The Rôle of Obstetrics in Preventive Medicine," "Maternity and Infant Welfare Centers, and "Industrial Occupations and the Health of Women Workers" indicate the highly commendable innovation instituted by the editor The final section deals with operations and other therapeutic procedures both in gynecology and in obstetrics

So much for the subject matter to which may be added that this enormous amount of material has been disposed of in less than 950 pages. But aside from the excellence of the essays presented, the great significance of the work lies in another direction. Several authors, in the past, have written separate textbooks both on gynecology and obstetrics for instance Hirst in this country Doederlein Hofmeier Fehling in Germany Berkeley and Eden in England A few writers have presented the two subjects in *one* volume Schauta of Vienna, did it about 25 years ago and before him Peter Mueller of Berne But that was at a time when the two subjects had not attained their present expansion There was an attempt made by Liepmann, of Berlin, to close the gap between the two sister sciences, but unfortunately the war intervened when only two of the projected five or six volumes had been published It is therefore a matter of gratification to see that this laudable idea has been carried out by Fairbairn in so satisfactory a manner He has clearly recognized that the term gynecology in its wider and truer sense means *all* the functions and anomalies of the female reproductive organs and, therefore, includes the phenomena of pregnancy and labor If there is any criticism to make it is this

to which it certainly is entitled It is hoped that the editor or rather the publishers will see their way clear so to enlarge the volume as to include a number of additional illustrations. But even in its present form, the work is bound to make many friends among students, practitioners and specialists.

treatment and their prevention and are meant to be of help to the general practitioner There are forty-seven of these pamphlets projected, many of which have already been printed They cover the entire field of medical practice and emanate from prominent representatives of the various specialties.

I have before me five of these slender paper bound volumes—three dealing with gynecology two with obstetrics. Henkel deals with the diseases urinary orrhœa, nitalia. is, and tubes, and the other pelvic structures. Fehling treats of the prevention of diagnostic and therapeutic errors

daily needs of the general practitioner and to point out the most frequent diagnostic and therapeutic mistakes made Because of the purely practical

[1] Obstetrics and Gynecology Edited by John S Fairbairn, M A B M B Ch, F R C P (Lond), F R C S (Eng) London Henry Frowde and Hodder & Stoughton, 1911

Diagnostische und therapeutische Irrtümer und deren Verhütung Frauenkrankheiten. Edited by Prof Dr J Veit Leipzig Georg Thieme 911

purpose of these monographs, all theoretical discussions, bibliographic references, and historical data have been omitted nor have extremely rare conditions been taken into consideration These pamphlets, then, are not to take the place of text books—in fact frequent reference is made to the latter so as to induce the reader to consult his stand ard works for more exhaustive study

It is not feasible to give any illustrative selections. Moreover, it must be obvious to the reader that this collection is of real value to the general practitioner—and the specialist too will find much to interest and instruct him in these pages An Italian and a Spanish translation are already under way An English translation would be highly desirable in the interest of those who do not read German

I feel very strongly that the editor may well be congratulated upon his happy idea and the felicitous manner in which it has been worked out.

A TINY booklet[1] giving in minute detail the technique as instituted by DeLee in the Chicago Lying In Hospital and Dispensary is mentioned here because I imagine that managers of maternity hospitals or outdoor clinics will be glad to adopt this excellent routine and to equip their students internes, and nurses with this little pamphlet which may be carried in the pocket or satchel To practitioners who take care of parturient women in their homes, this booklet is warmly to be recommended

[1] The Technic of the Chicago Lying-In Hospital and Dispensary By J B. DeLee M D 19[illegible]

BOOKS RECEIVED

Books received are acknowledged in this department, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender Selections will be made for review in the interests of our readers and as space permits.

THE SURGICAL EXPOSURE OF THE DEEP-SEATED BLOOD VESSELS. By J Fiolle, M.D., and J Delmas, M.D Translated and edited by Charles Greene Cumston, M.D London William Heinemann, Ltd., 1921

THE SURGICAL TREATMENT OF NON MALIGNANT AFFECTIONS OF THE STOMACH. By Charles Greene Cumston, M.D and Georges Patry M D With an introduction by Sir Berkeley G A. Moynihan, K.C M., G C.B., M.S London William Heinemann, Ltd., 1921

THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE WORLD WAR. Volume XV—Statistics. Part 1—Army Anthropology Prepared under the direction of M W Ireland, Surgeon General of the Army by Charles B Davenport and Albert G Love. Washington

THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS HELD IN THE HOTEL ASTOR NEW YORK, DECEMBER 8 AND 9 1921

THE MECHANICS OF THE DIGESTIVE TRACT By Walter C. Alvarez, M.D New York Paul B Hoeber 1922

AN INTRODUCTION TO DERMATOLOGY By Normal Walker LL.D , M.D F.R.C.P 7th ed. New York William Wood & Co., 1922.

PAPERS FROM THE MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH AND THE MEDICAL SCHOOL. Vol. I—1915–1920 Philadelphia and London W B Saunders Company 1921

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY By W A. Newman Dorland, A M , M.D F.A C.S

[illegible] W B Saunders Company

ON TUMORS. By [illegible]d. revised and enW B Saunders Company 1922

OPIATE ADDICTION Its HANDLING AND TREATMENT By Edward Huntington Williams M D New York The Macmillan Company 1922

CORRESPONDENCE

REMARKS ON BIOGRAPHY OF EPHRAIM McDOWELL BY AUGUST SCHACHNER

from one another without investigation thus perpetuating errors, but in some instances the same writers have contradicted themselves On page 285 we find the following "Hence most of the early sketches judged from this viewpoint were not only made prematurely but seemingly were largely based upon information transmitted from

Doctor McDowell has been more than ordinarily neglected although the Kentucky State Medical Association did erect in the year 1879 a monument at Danville to his memory Throughout the entire volume this conception as to the imperfection and inadequacy of all preceding efforts to perpetuate McDowell's memory and achievements seems to dominate the author's mind and supply the need for a more complete exposition of the subject

Doctor McDowell died in 1830 In 1852 Dr Samuel D Gross, then a resident of Louisville, read his biography of Ephraim McDowell, afterward incorporated in Gross American Medical Biography to the Kentucky State Medical Society With rare discrimination and persistent energy, Professor Gross sought out by correspondence and personal interview the associates relatives, and former patients of McDowell, gathered together

Gross original paper

In 1873 Dr John Davies Jackson, of Danville, Kentucky a physician of exceptional literary and scientific attainments, published a biographical

Ephraim McDowell, Father of Ovariotomy and Founder of Abdominal Surgery By August Schachner M D Philadelphia J B Lippincott C [illegible]

sketch of McDowell Referring to Gross biography he says He (Doctor Gross) has gone over the field as we have found out with extraordinary labor and care and his conclusions and comments upon the character of the object of his sketch, as we have verified them through the remaining contemporaries of McDowell, are most just and discriminating

In 1879 the dedication of the monument erected at Danville to the memory of McDowell by the Kentucky State Medical Society was the most imposing and impressive occasion in the annals of the medical profession of Kentucky The dedicatory address was delivered by Professor Gross before a large audience composed of members of the society distinguished physicians and surgeons from distant states, officials of the state and citizens of Danville and vicinity The classic address of Professor Gross together with other addresses and letters incident to the occasion were published in a

In 1909, when a century had elapsed since McDowell's first ovariotomy the American Gyne
cologi
center
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charac
the So
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of Louisville [illegible] on the Evolution of

in person The volume of transactions containing these papers and other proceedings honoring McDowell's memory is marked by distinctive binding bearing the title "McDowell Centennial

Space will not permit an enumeration of the other proceedings and publications at home and abroad which honor the name of Ephraim McDowell Upon the pages of every modern treatise on surgery and gynecology, and throughout medical literature his name will be found

It is apparent that the author of the book under review has made a diligent study of the literature relating to McDowell, and from many of the publica

tions enumerated he quotes, yet he seems at times to detach himself from recognized facts to indulge in such extreme statements as "Doctor McDowell has been more than ordinarily neglected etc. '

On page 222 the author in alluding to the removal of the remains of McDowell and his wife from the family burying-ground to McDowell Park in Danville makes an erroneous statement which does injustice to the committee which performed this duty for the venerated dead. He states that he was informed 'that the McDowell grave remained open following the re interment as those in charge were unable to decide whether the remains of Mrs McDowell should be removed with those of her husband. Strange to say this remained an open question for some years until it was finally referred to Dr J M Toner, of Washington, who settled it by directing that the remains of Mrs. McDowell be placed by the side of her distinguished husband, where they naturally belonged

The writer of this review as chairman of the *McDowell monument committee personally* employed the undertaker who made the removal and superintended the same Both bodies were exhumed on one and the same day carried in the same conveyance, and re interred, side by side, at the base of the monument in McDowell Park. In a work so elaborate in details as the book under review such a statement based upon rumor should not have been recorded when the facts could easily have been obtained from official sources

It is to be hoped that other biographies of McDowell will be written. Indeed it would be well if the American College of Surgeons would establish a lectureship in his honor similar to the [illegible] keep be eals the and his exalted conception of his duty to humanity To do this, however it is not necessary to discredit the work of those who rescued his name and fame from oblivion placed a monument over his grave and won for him the grateful recognition of surgeons throughout the civilized world

LEWIS S McMURTRY

Louisville Kentucky

AN ORIGINAL OPERATION UPON A DOUBLE UTERUS

To the Editor After a careful review of the literature I find so little written upon the subject of double uterus that I am led to believe my experience to be unusual. I have seen 2 cases of pregnancy in double uterus and one pregnancy in a single uterus with a double vagina besides a considerable number having the same deformity without pregnancy

The first case of pregnancy in a double uterus was encountered when giving relief to a case of incomplete abortion. This case after recovery disappeared from my view The only suggestive factor was that this woman was an habitual aborter this having been the fifth spontaneous abortion.

The pregnancy with double vagina was without interest except that the partition divided the vagina into two large cavities one not communicating with the cervical canal. After excision of partition the baby was born without difficulty

The subject of this paper has to do with the second case of pregnancy In a double uterus, the history being as follows

Mrs. Kate M of Middlebury Pennsylvania was admitted to the Williamsport Hospital as a private case on July 2 1914, accompanied by her family physician, Dr C. W Sheldon, of Tioga, Pennsylvania.

Examination disclosed a young woman of twenty-five, married 2 years, no pregnancies, menses normal, morning

fore all discussion as to variety of tumor was purely academic. It might be a dermoid but it mattered not to the patient. She was frightened and desired an operation to safeguard her future.

July 4, 1914, a laparotomy was made disclosing a double uterus with pregnancy in one barrel. The left pregnant side was greatly distended, with a 3 months pregnancy the uterus had enlarged laterally and the wall was so thin that the foetus could easily be felt and shadow seen It seemed clear that if the pregnancy were left, rupture would surely occur therefore we did a hysterotomy and removed foetus and placenta.

Examination of Interior of uterus disclosed a firm, thick walled septum, extending from fundus to cervix, and it seemed that the uterine compartments must have been of nearly equal size prior to pregnancy I massaged the [illegible]

taken to control bleeding and approximate peritoneum.

The only feature of the operation which I thought difficult was the removal of the septum in such a manner as to prevent its recurrence, for my experience with double vagina had taught me these partitions will reform if merely torn through Consequently the suture of the floor of the uterus was carefully and gently done.

The patient made an uneventful recovery and passed from my notice until July 2 1921 7 years

later when I received a reply to my note of follow up, as follows

You will note from Mrs. M's letter she has had

in these cases is not justifiable and not in accord with modern conservatism.

H J DONALDSON M D F A C S
Williamsport Pennsylvania

A CURED CASE OF INFILTRATING OSTEOGENIC BONE SARCOMA

THIS case is reported for the sole reason that it is the longest case on record of a cure of the above disease that has met the requirements in the way of proof laid down in the effort to get at the true results in this disease by Drs Codman, Bloodgood and Ewing The case has remained well since amputation of the leg on August 5, 1909

thought that this portion of the leg (lower part of femur) habitually rested against the steering post of his automobile The patient looked run down and thin but as he

the condition as an inflammation

The young man continued to lose weight and color and a pulsating tumor soon filled the wound X-ray pictures on July gave the appearance of a circumscribed sarcoma, but I could not say positively that it was not an osteomyelitis These X ray pictures have unfortunately been mislaid and cannot now be found The patient's leucocytes were 8,000 and there was no fever The von Pirquet test at this time was positive, but there was no response to the subcutaneous injection of 1 3, or 6 milligrams of tuberculin The patient gave no clinical history of, and has never at any time taken any treatment for syphilis

hospital August 27 He was able to go to work as a chauffeur September 24, and a month later had gained 26 pounds. He is now living and well and is a farmer by occupation

In response to Dr Codman's invitation issued to surgeons generally throughout the United States I sent sections from this case to him and they have been carefully studied both by himself and by Drs Bloodgood and Ewing

Dr Ewing writes "I was much impressed by your case of bone sarcoma It appears to be a genuine cure of osteogenic sarcoma by operation They are certainly very rare"

Dr Bloodgood writes: "Apparently there is no question that this is a sarcoma"

Dr Codman writes March 7 1921 "After all is said and done your case stands unequalled as the only living cured case of osteogenic sarcoma we know of"

Since then they have verified three other cases which they have recently reported (SURGERY GYNECOLOGY AND OBSTETRICS March, 1922)

Other pathologists perhaps might differ with these gentlemen but by their plan of a registry such sections will be preserved permanently for restudy

operations.

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thr s and
ren itions.

If certain standards were demanded for a certified diagnosis of the more rare conditions In surgery and other standard requirements were maintained in respect to the results of operation surgical literature could be immensely reduced in volume

Hartford Connecticut.

AMERICAN COLLEGE OF SURGEONS

MARCH AND APRIL MEETINGS OF STATE SECTIONS OF THE CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

DURING March and April there were three meetings of state sections of the American College of Surgeons in Birmingham, Alabama Asheville, North Carolina and Allen town, Pennsylvania

BIRMINGHAM, ALABAMA

The meeting in Birmingham took place March 2 and 3 with headquarters at the Tutwiler Hotel. Dr Cunningham Wilson, Birmingham, presided

The states of Louisiana, Mississippi Alabama, Georgia, and Florida were represented in this group It would seem evident that the grouping of five states on such an occasion is inadvisable, not only on account of the amount of travel involved for attending Fellows, but because of the somewhat evident lack of complete co-operation arising from the attempt to spread the meeting interest over five states Representation from at least two of the states should have been better than it was, and doubtless would have been in a meeting of as small a group as three states.

Ninety-seven Fellows were in attendance.

In addition to the members of the central office, Dr J M. T Finney, Baltimore Dr William R. Cubbins, Chicago, and Dr E P Hogan, Birmingham addressed the hospital conference and the public meeting

The clinics, as has been found to be the case throughout the South, were well organized and well carried out, with a very encouraging attendance of Fellows.

The hospital conference was attended by about 150

The public meeting had an attendance of about 300, which number would have been largely increased had the size of the hall permitted it. The addresses of Dr Finney and Dr Cubbins were of special interest here to the laity as well as to the attending surgeons and Fellows.

The scientific session was attended by some what over 100 and developed quite effective discussions of the papers presented

ASHEVILLE NORTH CAROLINA

An interim of two weeks intervened between
" of Asheville
od Mr Ray
he Fellows of

South and North Carolina

The Asheville meeting under the executive chairmanship of Dr Jacob F Highsmith and under the management of Dr H. H Briggs chairman of the committee on arrangements proved a high point in the tour of the country The smaller sessions were held in the Convention Hall of the Battery Park Hotel the public meeting at the Asheville Auditorium

There were 117 Fellows in attendance at the group meeting

Visiting speakers were Dr John B Deaver of Philadelphia, president of the College Dr John O Polak Brooklyn and Dr Joseph C Bloodgood of Baltimore.

The hospital conference presented the first tryout of the round table discussion in state meetings in this case led by Superintendent Robert Jolly of Houston. The meeting being intended to discuss problems and to present assistance to the hospital people as well as to instruct them succeeded rather effectively through the round table in accomplishing an end. It would appear desirable to establish this as a uniform part of the program for future hospital conferences.

The public meeting Monday night entirely filled the main floor of the Asheville Auditorium. The addresses of Dr Bloodgood on Prepared ness against Cancer, and of Dr Polak concerning "Antenatal Care were of natural and large interest to the audience.

A departure from the usual routine was had in the arrangement of the scientific sessions which occupied the entire second day of the convention, replacing the usual forenoon clinics. The representation of both North and South Carolina on the program was effected, and the papers, many of them illustrated were presented with unusual care and detail

The afternoon scientific session was one of especially marked interest owing to the clinic presided over by Dr Deaver and participated in

Carolina, and the completeness of the diagnostic work and notes made possible a detailed discussion by the speakers in each case.

ALLENTOWN PENNSYLVANIA

The Fellows of Pennsylvania Delaware and New Jersey met in Allentown on April 3 and 4.

Dr William L. Estes of Bethlehem presided, and Dr C D Schaeffer of Allentown chairman of the committee on arrangements, carried out one of the most successful meetings that the C

of the central office, Dr Polak, Dr Schaeffer Dr Baldy, and Dr Housman were on the program. This conference reached the high-water mark of all such meetings so far held there being fully 400 in attendance

The public meeting at the Allentown High School Auditorium likewise was one of the largest public meetings that has yet been held, over 1300 being present. Of the visiting speakers Dr Deaver spoke on Public Recognition of Scientific Medicine" and Dr Polak on 'Prenatal Care." The co-operation of churches and schools was indicated by the presence on the program of Monsignor Peter Masson, rector of the Church of the Sacred Heart and the Rev William F Curtis, president of Cedar Crest College.

The scientific session was likewise larger than any previously held during the Spring over

al Stitt, surgeon
Professor M J
school addressed

the meeting

Tuesday evening, the Fellows were guests of the Allentown Chamber of Commerce where 160 members of this body listened to the College program for the betterment of surgery hospitals, and public health

COMING MEETINGS

New England States at Portland Maine, May 15–16.

Nova Scotia, New Brunswick and Prince Edward Island at Halifax Nova Scotia, May 19–20.

MAY 1922

International Abstract of Surgery

Supplementary to

Surgery, Gynecology and Obstetrics

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COLLECTIVE REVIEW

THE PROGNOSIS AND TREATMENT OF PUERPERAL INFECTION

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THE prognosis and treatment of puerperal infection are dealt with together because they are intimately related. Localized peri uterine infections are not considered in this discussion

The treatment of acute puerperal infection has been the subject of much controversy because at the time of the appearance of the first symptoms it is impossible to establish an exact prognosis. Moreover it seems difficult to find a method of treatment sufficiently exact for the establishment of a prognosis.

This subject has been recently studied by Couinaud Director of the Clinic on the service of Brindeau With Clogne Chief of the Laboratory Couinaud has investigated the prognostic importance of the chemistry of the blood in cases of puerperal infections. He writes The prime importance of the estimation of the prognosis in the study of puerperal infections is evident as all of the present-day surgical procedures are dependent upon it.'

It is evident that if the infection is very severe it is of the utmost importance not to temporize On the other hand, if it will evolve favorably haste in the treatment may be responsible for useless mutilation Therefore a review of the means at our disposal by which we may rapidly establish a prognosis based on the degree and the type of the infection and the organic resistance is in order

These methods are of two kinds, clinical and laboratory From the clinical standpoint it is necessary first to distinguish puerperal infection from infection due to abortion The latter is generally much more serious than the former particularly in cases of criminal abortion.

Clinically considerable valuable information may be obtained from the history and etiology If the conditions of the accouchement are known the severity of the infection may be surmised A patient delivered under unfavorable conditions, with some obstruction to labor and doubtful asepsis, and who presents the signs of infection is menaced by a very severe septicæmia. The date of the onset of the infection has also been suggested as an element in the prognosis since a sudden onset is usually characteristic of the serious type of infection

Decided oscillations in the temperature and a very rapid pulse tending to exceed the temperature curve have been pointed out as factors indicating an unfavorable outcome, but in some cases the symptoms are deceiving The fœtidness of the lochia is not necessarily a sign of serious infection Often one sees a patient with fœtid lochia who does not present symptoms of general infection and on the other hand infection has occurred in cases in which the lochia had little odor

The patient s general condition gives more exact information severe and repeated hæmorrhages, albuminuria, and physiological distress are unfavorable signs. In the presence of the symptomatic triad of dryness of the tongue, profuse diarrhœa, and icterus the prognosis is very poor However none of the methods of clinical investigation at our disposal furnishes accurate data upon which we may rely with certainty In this condition, as in others, the clinical findings

must be evaluated with the bacteriological and chemical laboratory findings.

Bacteriology permits us to study the types of bacteria in the lochia collected within the uterine cavity. This examination however is of only relative value as occasionally many types of bacteria are found. Since the work of Widal and Fabre, it has been known that puerperal infection is due to numerous bacteria, but that only one of all those within the uterus, usually the streptococcus, is responsible for septicaemia. Therefore a bacteriological examination of the blood is also of great importance. The discovery of the same bacterium in the blood establishes the cause of the infection.

The infections due to the hæmolytic streptococcus are very serious but the presence of streptococci in the blood is not necessarily the sign of a fatal septicæmia as cases of puerperal infection with positive blood cultures have become cured while others with negative blood cultures have been fatal. Moreover there are streptococcic infections which recover and infections due to other micro-organisms which cause death. The statistics of Cathala prove this fact. In the nine cases on which these statistics are based the blood cultures were negative in four, three terminated in recovery and one in death. Of five cases with positive blood cultures, three were cases of streptococcic infection and two were cases of staphylococcic infection. Of the three streptococcic infections two ended in recovery. Of the two staphylococcic infections, one was fatal. Therefore at best the methods of investigation are imperfect.

In recent years the chemical composition of the blood in infections has been studied. Coulnaud and Clogne on the clinical service of Brindeau at the Hôpital de la Pitié attempted to determine whether in puerperal as well as in other infections, *the severity of the prognosis is related to a* high nitrogen content. According to their findings it appears that an increase in the blood urea associated with an increase in the residual nitrogen may be related to the infection and only to the infection. This increase appears to be proportional to the gravity of the condition. Coulnaud and Clogne believe that the increase in the nitrogen content is due to poor renal and hepatic function. It cannot be due to the phenomenon of

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condition of the liver and kidneys. At any rate the fact that the increase in the urea is proportional to the gravity of the infection is of prognostic importance. Unfortunately the number of observations is still much too small to warrant definite conclusions and it must be admitted that in the present state of our knowledge there is no clinical symptom or laboratory method which will permit us to foretell the outcome of a puerperal infection at its onset. Hence the indecision which has persisted for a long time regarding the methods to be employed in combating the septicæmia.

The treatment of puerperal infection is a question of very great importance since the incidence of the condition is relatively high (10 per cent) and it is a serious infection. The mortality as given by various authors varies from 21 to 51 per cent. The methods of treatment are numerous and one may say that all of them have succeeded in certain cases and all have failed in others.

The treatment of puerperal infection has passed through many phases. At one extreme is the period of radical uterine intervention and at the other the use of local therapy consisting of curettage, sponging, cauterization, and intrauterine lavage.

Instrumental curettage with a sharp curette was very soon abandoned. In removing all of the uterine mucosa the sharp instrument traumatizes the internal surface of the infected uterus and the curettage is stopped only when grating is felt (the uterine cry"). The barriers formed by the endometrium are broken down and new avenues of infection are opened. This treatment is to be rejected also in cases of endometritis. It is unreasonable to expect to remove all the infected portion by means of the curette and such scraping causes bacterial reinoculations. The remaining healthy portion of the mucous membrane

cosa is greater than the number of lives it has saved.

A a substitute for instrumental curettage Budin has recommended digital curettage which thoroughly cleanses the uterus and is much less traumatizing. Certain gynecologists however object to digital exploration as it is very painful and nearly always requires general anæsthesia, they prefer instrumental curettage with dull instruments. Many use a simple tampon grasped in a forceps with which they sponge out the uterus.

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proposed the use of a forceps curved upon the flat for this procedure Obstetricians who once routinely practised various methods of cleansing the uterine cavity often followed the curettage with intra-uterine cauterization and drained the uterus by means of Mouchotte metal drains Croisier drains or ordinary rubber drains At present, drainage is employed only when the uterus is so markedly flexed that the flow of lochia is obstructed

At the Congress in Paris in 1921 Audérodias of Bordeaux proposed intermittent irrigation by the Carrel method He cited statistics of 152 cases of infection in which there were 133 cures Curettage has been much discussed recently It has its advocates and its enemies Many gynecologists do not practise curettage unless they observe the signs of placental retention—incomplete uterine regression a large soft uterus with a gaping cervix Others practise it systematically at the first symptoms of infection even when there are no definite signs of retention They believe that there always remains a slight residue of decidua which may cause an elevation of temperature All agree in advocating a non traumatizing exploration without an attempt to remove the uterine mucosa

The period in which uterine intervention was advocated was followed by a period in which in addition to local treatment, measures were taken to combat the general infection Attempts were made to cleanse the blood by means of intravenous injections of serum in massive doses. Later injections of colloids were given for the same purpose As a rule collargol and electrargol were used but many other colloids were also employed. More recently the use of salvarsan has been proposed In certain cases the injections have seemed to favor the rapid termination of the infection It appeared that whenever it was possible to cause a classical colloidal shock there was a certain degree of amelioration, but from the standpoint of a more favorable effect there was much disappointment

It was during this same period that the practice of abscess fixation Fochier's method was begun This also seemed in certain cases to have a favorable effect on the course of the infection

About the same time that the colloids were in vogue Pinard and following his lead a certain number of obstetricians, attempted to combat the infection by means of the antistreptococcus serum of Marmorek Very often this is without effect At the present time we are using a similar method but use vaccines instead of sera As a rule, stock vaccines are employed as in puerperal septicæmia there is no time to prepare an autogenous vaccine

In January, 1921 Lequeux Lafont and Chomé made use of Le Moigne's vaccine, an oily solution of streptococci. Statistics show that it has been employed in the treatment of infection that has already developed and as a preventive of infection The impression has been gained that in infections of moderate virulence it has had a favorable influence. In the virulent types it does not appear to have had any influence whatever upon the disease. In ninety three cases in which vaccine was employed as prophylactic treatment there were no cases of streptococcæmia although thirty two of the women had complicated deliveries.

Recently Delmas has used subcutaneous injections of the blood serum of patients convalescing from puerperal infections. In judging this method as well as those which preceded it one must take into consideration the poor results as well as those which are favorable

Regarding the surgical treatment of puerperal infection obstetricians and gynecologists are not in agreement There are both abstentionists and those who advocate surgical procedures. The abstentionists content themselves with applying ice to the abdomen detoxicating the organism by increasing evacuation, and stimulating the body by the usual methods, such as the injection of camphorated oil spartein adrenalin, strychnine physiological salt solution, glucose and hyperglucose solutions. Certain obstetricians give hepatic extract in the belief that the function of the liver plays the chief rôle in the organic defense

The advocates of surgical procedures propose to free the body from the initial focus of infection by performing a hysterectomy Before discussing hysterectomy a word should be said regarding the operation of Trendelenburg and Freund viz ligation of the thrombosed veins The first operation of this kind in France was performed by Faure in the Tarnier clinic. Recently Lequeux and Chomé reported to the Obstetrical Society a case of puerperal pyæmia in which they effected a cure by this procedure. The value of a surgical operation in the presence of puerperal pyæmia was discussed by Jeannin Vauverts, and Pocot in a report to the Obstetrical Society of France in 1912 According to the conclusions of this report intervention is justified only in the following cases

1 Those in which thrombophlebitis is not associated with extravascular lesions.

2 Those in which localization to the veins of the pelvis permits intervention below the thrombosis in the healthy parts of the venous system.

Lequeux and Chomé reported that in their cases these two conditions were not present that, in fact there existed in addition to the thrombophlebitis a lesion of the adnexa charac with the the s ex

tended too high to permit the application of the ligature below the lesion and the ligature was therefore placed entirely about the thrombosed area. In spite of these unfavorable conditions the patients recovered A certain number of observations of this kind would evidently encourage intervention in a greater number of cases of pyemia

The question of hysterectomy in cases of puerperal septicemia is one of those which have been discussed widely by obstetricians and gynecologists in the last few years

The first hysterectomy for puerperal infection was performed by Schulze of Jena in 1886 This was not the vaginal type of operation but the abdominal type. Subsequently the question was not taken up again until 1895 when Winterberg

the forty-sixth meeting of the American Medical Association Intervention found defenders in Smith, Peterson and Noble, but was opposed by Da Costa and Price. Since then hysterectomy in puerperal infections has been the subject of much controversy being accepted by some and rejected by others

In 1901 intervention was again championed by Tuffier before the Surgical Society of Paris, and by Demelin and Jeannin before the Obstetrical Society They were supported by Terrier Faure, and Quénu Ricard Budin, and Maygrier were opposed to the operation

At the Congress in Rome in 1902 and at Madrid in 1903 hysterectomy was again the subject of the day It found partisans in Tuffier Bumm Latzko Mackenroth and Cortiguera. Pinard on the contrary declared that a rational indication for it does not exist in puerperal infection. The subject was discussed also at the last Obstetrical Congress in Paris.

Potvin of Brussels proposed hysterectomy in the following conditions

1 When it is certain that the uterus is empty that no other affected organ is the cause of the continuation of the infectious process, and the septicemia arises from deep infection of the mucosa and submucosa of the uterus.

2 When the puerperal infection is not caused by placental retention but is due to an external infection entering the uterine wound and causing an endometritis of the streptococcus staphylococcus, gonococcus, or colon bacillus type

Potvin stated that under such circumstances the removal of the infected organ is indicated because there is as yet no method of medical treatment by which the condition can be combated successfully He insists that hysterectomy should never be performed *in extremis* for if it is done too late it only hastens death

Potvin as well as others who are defenders of hysterectomy, regards vaginal hysterectomy as the procedure of choice. As compared with the abdominal hysterectomy this operation which has been recommended by Faure for thirty years, presents the advantages that it is more rapid and less shock-producing prevents the dissemination of infection to the abdominal peritoneum and favors drainage Abdominal hysterectomy is to be performed only in the presence of contra indications to the vaginal operation that is when difficulty in pulling down the uterus is anticipated when a phlebitis has developed in the utero-ovarian veins, or when the infection has passed the pelvis and is spreading toward the abdominal peritoneum Under such circumstances intervention by the abdominal route is justifiable.

Cotte of Lyons has arrived at analogous conclusions regarding the indications for hysterectomy He admits that in the present state of science with the exception of cases in which there is a lesion of the uterus demanding immediate ablation hysterectomy cannot be proposed at the beginning of the outbreak of the infection because at this time there is no clinical or laboratory means by which we can foretell with certainty the seriousness of the infection He advocates intervention in the following types of cases

1 Cases of acute prolonged remittent infection which so often leads to a fatal issue through secondary septicemia or pyemia.

2 The acute forms following abortion particularly criminal abortion

3 Cases of primary acute puerperal septicemia.

In such cases, on the basis of our medical as well as our surgical methods, Cotte believes that intervention may be performed because the septicemia may be dependent upon an undiscovered local lesion

Cadenat is also a defender of vaginal hysterectomy The question of mutilation, he says, ought not to be considered when the mother's life is threatened In the vaginal hysterectomy shock is reduced to the minimum The objection that the operation is useless is not valid unless it is performed too late

Cadenat rejects intervention in certain cases of hyperseptic infection In these, he believes nothing can be done. For the ordinary acute or subacute forms he advocates operation based upon the following conditions the stage of the pregnancy (infection is more serious the nearer the pregnancy to term) elevation of the temperature, slight abdominal contraction pain in the cul-de-sac of Douglas and a negative blood culture. If all these conditions are late or accentuated, operation should not be performed because it may be too late or the body may be beginning to recover from the infection.

Regarding the time at which operation should be done Cadenat agrees with Faure that intervention is indicated if, twenty four hours after a uterine exploration there is no amelioration, fever persists, the pulse is rapid and the patient complains of chills

Brindeau is not as enthusiastic regarding intervention As puerperal infections often recover spontaneously (140 out of 175 cases) he does not agree with Faure He believes in differentiating postpartum infections which involve the entire organism from postabortum infections which remain well localized in the true pelvis In the latter, intervention is indicated, while in the former it is contra indicated except in cases of uterine laceration and gangrenous fibromata.

Wallick supports the theory expressed by Pinard in 1903 with regard to the absence of indications for hysterectomy and states that this still holds true to-day

From this review it appears that Faure is correct in the belief that the question is still undecided On the basis of the etiological facts and the clinical and laboratory findings certain gynecologists and obstetricians make deductions regarding the prognosis and the indications for operation but these deductions are subject to variations entirely personal In cases with identical symptoms and laboratory findings some will operate and others will not The procedure depends entirely upon the surgical tendency of the gynecologist or obstetrician and it seems evident that the treatment of acute puerperal infection will not be definitely settled until facts permitting the establishment of a definite prognosis are furnished by the clinic and the laboratory

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ASEPTIC AND ANTISEPTIC SURGERY

Rector F L.: Iodine as a Wound Disinfectant *Nation's Health* 1922 iv 38

The author states that the use of iodine as a disinfectant for the skin particularly for the field of operative surgery came prominently before the public in 1905 Among the first to introduce it to the profession were Cannaday Woodbury Dann reuther and Grossuck Grossuck was the first to write comprehensively on the subject

The undiluted tincture and a 20 per cent solution were first employed Experimenting to find the proper strength for routine use Bovee and Neate of America and Turner and Catto of England came to the conclusion that a 3 to 3 5 per cent solution was best Kinnaman found that a 0 2 to 1 per cent solution was far superior to bichloride of mercury Schantz in 1908 claimed that the irritation caused by the solution stimulates healing so that a smaller scar results Schantz paints small wounds on the third and fifth day large ones daily

Of the sixty five physicians replying to a questionnaire sent out recently two use a 10 per cent solution eighteen a U S P 7 per cent tincture twenty-one a 3 5 per cent (50 per cent U S P) tincture ten a 3 per cent tincture three, a 2 per cent tincture and eleven a 4 or 5 per cent solution Several emphasized the importance of having the surface dry before applying the tincture and recommended the use of alcohol and ether as final cleansing agents before the application of the iodine Grease may be removed with gasoline or benzine

Objections to the use of the tincture were (1) the danger of burning, and (2) the sealing of punctured wounds and the formation of a crust on the more extensive wounds which delays healing The use of bichloride of mercury following the application of iodine is said to be harmful

EARL K LAMBERT M D

ANÆSTHESIA

[illegible] Operative Report *Ill Ass*

Five years ago in the urinalyses made in a series of laparotomy cases the authors found acetone in 60 per cent and diacetic acid in 25 per cent during the first twenty four hours after operation A routine was then inaugurated by which when possible every patient was given before operation 15 gr of sodium bicarbonate and 5 gr of lactose every four hours for six or eight doses. In these cases the urine was alkaline and the amount of acetone bodies was reduced but not entirely eliminated The patient's general condition was improved nausea being less and not one in the series showed severe acidosis

Gratifying results were obtained with the synergistic method of Gwathmey with preliminary alkaline treatment in a series of cases in which ether was used to induce general anæsthesia The technique consisted of alkaline treatment with sodium bicarbonate and lactose for several days before the operation The immediate pre-operative treatment consisted of a hypodermoclysis of 200 c. cm of a 4 per cent chemically pure and sterile solution of magnesium sulphate given one and one-half hours before the operation and from 1/10 to 1/6 gr of morphine sulphate in 1 5 c. cm. of a 25 per cent chemically pure and sterile solution of the magnesium sulphate given at fifteen-minute intervals for two or three doses beginning one and a quarter hours before operation

There were no deleterious results such as abscess necrosis of the tissues, or laxative effect Glass and Wallace therefore concluded that with the alkaline synergistic method the postoperative condition is entirely altered. Absence of gas wound pains, and distention improvement in the appetite and decreased mental depression make convalescence shorter and more agreeable

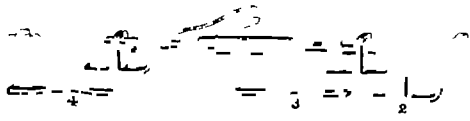
ISABELLA C HYDE, M.D

SURGICAL INSTRUMENTS AND APPARATUS

Lewis, E. J.: A Turnbuckle Extension Apparatus for the Reduction of Fractures. *J Am M Ass* 1922 lxxviii, 108.

Interest in fractures has been stimulated recently by the war and the inquiries of the industrial commissions and compensation boards. Various new methods of treatment have been suggested and tried especially in the recently established fracture wards of the larger hospitals.

The author has devised a fracture reducing apparatus consisting of several units Each unit is made up of two steel rods joined by a turnbuckle with right and left threads extending except for a short interval, along its entire length to allow a hold for a wrench Each unit acts as a truss rod or support for the broken bone as it is locked at each end into an inverted T-shaped anchor post which is firmly set in the plaster The vertical limb of the anchor protrudes through the plaster and is per



One of the units 1 turnbuckle 2 anchor post 3 and 4 two forms of wrench

forated to receive and hold the end of the truss rod by means of a lock nut

It is usually necessary to use three or four units By adjustment of the length of the truss rods at the anchor posts and through the central turnbuckle the angulation and shortening of the bone may be overcome The finer manipulations may be carried out under the fluoroscope.

Special care must be taken to use sufficient and properly placed padding in the application of the cast The joints at the ends of the broken bone should be flexed to a right angle if possible and the cast extended for some distance above and below the injured part There is maximum muscle relaxation

The appliance has been found most useful for transverse and dentate fractures of the tibia the shaft of the femur and of one or both bones of the forearm. It is light compact economical and accurate. DANIEL H. LEVINTHAL, M D

SURGERY OF THE HEAD AND NECK

HEAD

Little, J M : Observations on the Operative Treatment of Epilepsy with a Report of Fourteen Cases. *Boston M & S J* 1922 clxxvi, 65

Three cases of Jacksonian epilepsy are reported in detail. One patient had not had a seizure in eleven and one-half years after the operation The second, during a period of nine years had been greatly improved although the seizures continued The third still had epileptic seizures six years after the operation but they were of a milder form All three were able to work and support themselves.

Eleven cases were of the general epileptic type and either the decompression of Cushing or the trap-door drainage of the motor area recommended by Krause was performed All were temporarily benefited Five died in from eight months to three years after the operation. Three patients were relieved two had recurrence of the attacks, and one was not benefited

Eighty-one cases collected from the literature are outlined in a table.

Little does not wish to start the over-enthusiastic surgeon on a career of indiscriminate operating for epilepsy but believes operation is beneficial in some cases. The first essential is the proper selection of cases and the second the choice of the proper operation. CARL R. STEINKE, M.D

Troell, A., and Hesser C.: The Problem of Cerebellar Localization (Ueber das cerebellare Lokalisationsproblem) *Acta chirurg Scand.*, 1921 liv 211

The purpose of these investigations was to discover the localization of function in the cerebellum The starting point was the theory advanced by Bolk which is based on his comparative experiments on the morphology of the cerebellum According to Bolk s morphologic classification of the mammalian cerebellum cerebellar function is distributed in the as functional entities the anterior lobe contains the centers of the muscle groups of the head (eyes, tongue chewing and mimic muscles) and also those of the laryngeal and pharyngeal musculatures The lobulus simplex contains the centers for the neck muscles and those of the nape of the neck the Sublobules C_1 and C_2 of the posterior median lobule, the centers of bilateral synergistic motions of the extremities the ansiform and paramedian lobules, those of unilateral isolated motions of the extremities and the Sublobules (A) and (B) of the posterior median lobule and the vermicular formation are the centers for the musculature of the trunk, that is, the back, abdomen perineum and tail, respectively

The clinical and experimental results of others do not coincide with Bolk s results. There were many difficulties to overcome as it is necessary to produce the lesions more or less blindly through trephine openings The authors tests were made on dogs, cats and pigeons Cortical extirpations within the area of the ansiform lobule resulted in locomotor disturbances in the extremity of the same side in the form of hypermetria adduction, extension or flexion postures and spasticity the muscles of the anterior extremity of the same side are represented in Crus 1 and Crus 2 which contain centers for the muscle synergy of the anterior and posterior extremities of the same side.

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—and this is advisable in almost all primary dressings—it must be borne in mind that its continued use over an extended period may cause symptoms of iodoform poisoning

The author has rarely used irrigation in cases of brain abscess

In cases of imperfect drainage, finger exploration has proved of value Smith believes that the principle of the Mosher and the British Army drain is good but states that he has not used these drains

The dressings should be changed once or if necessary twice a day

The encapsulated form of abscess requires a longer period to heal by the development of granulations than the unencapsulated type, and must therefore be drained for a longer time

The dura should not be sutured The usual methods of protecting the dura before and during operation should be scrupulously carried out afterward until the abscess has entirely healed and the wound is closed H A McKinnon M D

Trotter B C.: A Case of Lateral Sinus Thrombosis. *Lancet* 1922 cci, 128

The article describes an interesting case of lateral sinus thrombosis probably due to acute pyorrhea and alveolar abscess

The patient was a healthy farm laborer who after working in the hot sun, developed headache, dizziness, and a tender swelling in front of the right ear All of his teeth were more or less decayed, and the gums swollen, red, and purulent Two days later after chills high fever sweating and otorrhea, a diagnosis of acute otitis media with lateral sinus thrombosis was made

Two days later he was operated upon The internal jugular vein, which was found to be empty was ligated through an incision over the anterior border of the sternocleidomastoid muscle and the incision closed except for the lower ½ in The mastoid was then opened, but no pus was found When the incision was deepened down to the lateral sinus a quantity of foul, blackish liquid pus was evacuated The opening into the lateral sinus was enlarged to admit the end of the little finger and the cavity washed out with hydrogen peroxide A drainage tube was then inserted and the wound lightly packed with sterile gauze

After severe headache and fever for about two weeks the patient recovered Vomiting was pernicious and was stopped only by ½ oz. doses of champagne every hour for several hours.

A foul nasopharyngeal discharge on the fourteenth day which interfered with deglutition was cleared up after a week by a nasal douche and gargle of a mild alkaline solution

On the fifteenth day headache was persistent but was relieved by needle puncture of the posterior fossa and the removal of turbid fluid The next day incision and drainage over this spot marked the turning point in the patient's condition On the sixteenth day the teeth were removed. Recovery was rapid, with complete healing on the thirty first day

The infection probably began in the teeth and from there progressed to the lateral sinus through the pharyngeal veins, parotid region, and internal jugular vein by ascending thrombosis.

Marcus H. Howarr M.D

Frazier, C. H.: Neuralgias of the Trigeminal Tract and Facial Neuralgias of Other Origin: Impressions Derived from a Survey of 555 Cases. *Ann. Otol Rhinol & Laryngol* 1921 xxv 855

Major trigeminal neuralgia begins without any apparent exciting cause and usually after middle life with a sharp shooting stabbing lancinating pain in one of the three divisions of the trigeminal nerve usually the second or third The pain is likened by the patient to an electric shock or the pain that would be caused by a boring hot iron or the tearing of flesh. Its distribution has definite anatomical limitations and without variation it is referred to the terminal distribution of the nerve involved to the lips, gums, tongue teeth nose or forehead.

The pain is not controlled by morphine The habitual use of morphine is presumptive evidence that the patient is not a subject of major trigeminal neuralgia

The neuralgias due to tumor invasion may be confused with the major trigeminal neuralgias. If the

case would not be so conspicuously a unilateral affection.

tract is of no avail.

Frazier summarizes his observations regarding the types of neuralgia as follows

"We recognize first of all a definite clinical entity in what we prefer to call major trigeminal neuralgia, the symptoms of which are so char

simulating the major type, such as the neuralgias due to tumors involving the sensory root the

ganglion or its several divisions or the neuralgia following herpes zoster We recognize a third group of neuralgias involving chiefly the ophthalmic division that we believe to be of toxic origin symptomatically they have nothing in common with the major type We recognize a fourth or miscellaneous group in which the pain though of great intensity but not paroxysmal is referred chiefly to the orbit temple and cheek, sometimes to the neck and is associated frequently with general headache or hemicrania a group in which our suspicion has been aroused as to the part the sympathetic system may play in its origin We recognize finally a fifth group which we classify with the psychoneuroses or psychalgias.

In cases of major trigeminal neuralgia Frazier has done 204 avulsions or sections of the sensory root five complete excisions of the ganglion, and five partial excisions of the ganglion. There has been but one operative fatality in the last 177 cases The operative technique is described

Complications which may follow the operation are anaesthesia of the area supplied by the nerve operated upon deterioration of hearing on the side operated upon trophic lesions in the cornea which are easily controlled by proper early treatment and transitory facial paralysis. In the last 121 cases in which the self retaining retractor was not used transitory facial paralysis did not develop

If a clear case is made out for neuralgia of the sphenopalatine ganglion type, permanent relief will come only when the ganglion is excised. The part which the sphenopalatine ganglion plays in the etiology of these atypical forms cannot be definitely *determined until the ganglion itself has been* excised in a series of properly selected cases In this problem and in the investigation of the rôle of the sympathetic system lies the most fertile field for future research

Six cases are reported to illustrate the various types of neuralgia CARL R STEINKE, M D

Krueger R The Surgical Treatment of Prognathism (Die chirurgische Behandlung der Progenie) *Arch f klin Chir* 1921 cxvii 261

ital or acquired as the result of a fracture luxation or joint disease In the first type the true prognathism the initial symptoms appear about the sixth year of life and end at the time of puberty as complete prognathism In the beginning dental orthopedic measures may be considered but after the end of the bony development of the mandible results can be obtained only by surgical-dental treatment

Various measures have been proposed. In the choice of a method the deciding factor under all circumstances must be the anatomical character of the particular case. Up to the present time the literature contains the reports of (1) wedge or trapezoid resections from the horizontal ramus of the lower jaw (2) the same resections from the angle of the jaw (3) the sawing through of the ascending ramus with displacement of the fragments (4) the arched sawing through of the angle of the jaw and (5) resections of both condyles.

After a short critical review of these various procedures and a consideration of the alleged disadvantages associated with bilateral resection at the horizontal ramus the author describes the treatment used by Schroeder Ernst and himself in three cases. The first part of the technique consisted in the preparation of the mouth the creation of gaps between the teeth, the formation of the plaster models for the preparation of the splint apparatus and resection to allow a normal bite and the mounting of the splints on the teeth Then, under local and conduction anaesthesia a small incision was made parallel with and below the border of the lower jaw the bone was exposed subperiosteally in the tooth space without opening the oral cavity, an angular division of the mandible was effected by means of closely placed bored holes of small caliber and division of the intervening trabecula of bone with a chisel, the maxillary fragments with was given during the first few days. Bone sutures were avoided. Consolidation occurred in two or three months and the cosmetic and functional results were excellent. HEINEMANN-GRUEDER (Z)

NECK

Bloch, J C., and Charrier J : Notes on the Surgical Treatment of Goiter (Notes sur le traitement chirurgical des goitres) *Presse méd* Par 1921 xxix, 853.

The authors state that during a recent trip to Berne they had occasion to see a number of operations for goiter an affliction so frequent in Switz

detail.

The indications for operation vary according to whether the condition is simple or exophthalmic goiter

In France the nodular and cystic goiters predominate and the usual operative procedure is an enucleation without previous ligature. In Switzerland, on the contrary the incidence of parenchymatous goiters is about 10 per cent not including the goiters called goitres du soldat which are common between the ages of 20 and 25 years and are both parenchymatous and nodular In such cases enucleation is impossible

one superior thyroid artery or the anterior branches of both of them. The goiter is resected by means of

lobes, the technique employed for parenchymatous goiters is used As soon as the ligatures have been made, a strumectomy is performed Sometimes, but only when there is a single cyst or an isolated lump subcapsular enucleation is done

The authors state that in their astonishment at seeing the Swiss surgeons employ such a complex and difficult technique, they asked the reason why resection was preferred to enucleation All the operators replied that the conservation of a large portion of

that they produce a partial anemia of the gland

For the treatment of Basedow s disease the Swiss surgeons, de Quervain in particular advocate opera

seem to attach as much importance to the metabolism as American surgeons De Quervain in particu

when the condition is so severe that operation is contra-indicated In such cases rest in bed and the administration of bromides make it possible to delay operation until the condition has improved

required it can be performed easily The ideal

inferior artery

The authors describe the regional anatomy with special reference to the descriptions of de Quervain and Cunéo and in a schematic drawing show the

routes of access to the inferior thyroid artery and the gland.

In the rest of the article the operative technique employed by the Swiss surgeons is described in detail Regional anæsthesia induced by means of a 1 200 solution of novocaine is practically always employed The incision is made in accordance with the technique of Kocher The various steps in the ligation of the inferior thyroid arteries, the delivery of the goiter the ligation of the superior thyroid arteries the resection of the goiter and the closure of the wound are described.

In conclusion the authors state that in their opinion all the indications for the surgical treatment of goiter in France are met by subcapsular enucleation W O Johnson M D

Crile G. W., and Lower W. E.: Special Points in the Technique of Operations on the Thyroid Gland *Ann Surg* 1922 lxxv 47

On the basis of their experience the authors emphasize the following points in the operative technique

1 In general the functional equivalent of a normal gland should be left This means a small piece of an exophthalmic gland and a large amount of a colloid goiter

2 Resecting only the larger lobe has a poor cosmetic effect Removing both lobes and leaving the poles which will appear as lumps, is not entirely satisfactory If the median lobe is left it suggests an Adam s apple

3. A long vertical median incision is used only for midline adenomata or small goiters. High division of the muscles does not permit adequate dissection of the lower pole When more than a vertical incision is necessary transverse division is employed

traction, pressure, and stretching may damage the recurrent nerves, cause immediate bilateral paralysis of the vocal cords, interfere with the air intake, and necessitate tracheotomy Bronchopneumonia and death may result. A large vein may be torn and complicate the operative field Primary separation of the upper attachment of the lobe and a slight pull from above permits the thyroid to rise out

7 Catching and tying bleeding vessels on the surface of the trachea necessitates the inclusion of the peritracheal fascia and sensory nerves which enter the trachea This may cause irritation, coughing, and increased mucus with possible resultant local tracheitis, bronchitis, bronchopneumonia and death. This is avoided by bloodless dissection above

the line of cleavage so that vessels may be ligated without including the sensory nerves.

8 Interference with the mechanism of swallowing may result from (1) dislodging with the finger a gland that has extended between the larynx and œsophagus and pharynx, (2) attempting to catch an escaped superior or inferior artery (3) dissecting between the œsophagus and larynx

9 A collapsed trachea may be dilated by means of the gas-oxygen apparatus. For tracheotomy a small transverse opening between the rings should be made early rather than late.

10 The operative field must be kept clear

11 Blood in the trachea may initiate bronchopneumonia.

12 In serious cases the wound is left completely open and dressed with gauze soaked in a 1 5,000 solution of flavine. The advantages are (1) a decrease in the time of the operation (2) the absence of postoperative pain and discomfort (3) the prevention of absorption of aseptic wound secretion. Wounds are closed under analgesia and local anæsthesia with the patient in bed, usually on the afternoon of the same day or the next morning but occasionally on the second day After the first six hours there is a slight tendency to increased contamination.

13 The operation is stopped at any point when there is doubt as to the outcome. It can usually be resumed and completed on the following morning

14. If patients demand to know the time of operation they are told but otherwise preparations are carried on so carefully that they will not know the place or time

15 Although the X ray reduces the activity of the thyroid it has the following disadvantages (1) the dose required to produce a given effect is guessed at if it is sufficient to kill all thyroid cells myxœdema results If it does not kill the cells, relapse occurs (2) relapses are common (3) delay in unsuccessful cases leads to serious damage to the myocardium, liver nervous system, etc , and (4) scar tissue and adhesions caused by the X ray

a preliminary to
rarely cures and

17 The beneficial effect of ligation is due probably not to the decrease in the blood supply but to the break in the sympathetic nerves which lie on the walls of the superior thyroid arteries

18 A diagnosis of hyperthyroidism is an indication for thyroidectomy If rest fails to cure, the patient sustains serious damage to the myocardium liver and nervous system, and the difficulty of operation is increased

On the basis of operability the authors class hyperthyroidism with appendicitis. The mortality of thyroidectomy is almost as low as that of appendectomy WALTER C. BURKET M D

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Hedblom C. A.: The Diagnosis and Treatment of Tuberculous Empyema. *J Lancet* 1921 n s. xli 644.

The author discusses the etiology, pathology, bacteriology diagnosis and treatment of tuberculous empyema The end results are known in sixty seven of seventy-four cases treated at the Mayo Clinic since 1910 Fifty-eight and two-tenths per cent of the patients are cured or much improved nearly 4 5 per cent are not improved, 37 3 per cent are dead and 14.9 per cent died within two months of the operation

In a summary the author formulates tentative conclusions as follows

In a large number of cases primary or idiopathic pleurisy with effusion is probably tuberculous in nature

Tuberculous pleurisy may be primary or it may be secondary to a pulmonary, peritoneal or other tuberculous lesion

The onset of tuberculous effusion may be insidious or sudden, and may be associated with an acute and severe constitutional reaction

A mixed infection due to the perforation of a tuberculous cavitation often runs an acute and rapidly fatal course

The diagnosis of tuberculous empyema is made by the demonstration of the bacilli in the exudate by animal inoculation or by examination of the sectioned pleura.

A sterile effusion is probably tuberculous an infected effusion may be tuberculous.

An empyema may be tuberculous in spite of per

nite dyspnœa on exertion or symptoms of circulatory embarrassment.

The replacing of aspirated fluid by nitrogen or filtered air may be indicated in cases with symptoms of active phthisis referable to the same side as the effusion

A sterile purulent effusion should be treated as though it were serous if the lung expands when the fluid is withdrawn If the lung is fixed in a collapsed condition or if the purulent effusion persistently recurs, a plastic operation may be indicated

An infected purulent effusion should be treated by the closed method with antiseptic irrigations or by open drainage open drainage is indicated especially

in cases of severe infection associated with extensive pulmonary tuberculosis.

A plastic operation involving closure of a bronchus offers the only prospect of cure in a case with an associated large bronchial fistula

Dakin's solution may be contra-indicated in the presence of an extensively diseased lung because of its corroding action on superficial lesions resulting possibly in hemorrhage or the formation of a bronchial fistula.

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L. H. Fowler, M.D.

Shortle, A. G., and Gekler, W. A.: A Report of Four Recent Cases of Thoracoplasty. *J. Am. M. Ass.* 19 : lxxvii, 168.

The failure of the earlier operations for collapse of the lungs was due to (1) the shock caused by lengthy operations and the loss of blood and (2) disturbance of the respiratory rate, mediastinal flutter and often death caused by the removal of one side of the chest wall.

It has been found that in 25 per cent of cases artificial pneumothorax is unsuccessful because of pleuritic adhesions. Instead of the Friedrich operation, the authors have adopted the safer operation of Sauerbruch in which ribs from the first to the ninth are resected, usually at one sitting, and gas-oxygen is used instead of ether.

In this article the following cases are reported.

Case 1. The patient was a woman, 45 years of age, who had had pleurisy with effusion in 1910. In 1918 cough and partial loss of voice developed. The sputum contained tubercle bacilli. The afternoon temperature was 99.5 degrees F. Artificial pneumothorax in April, 1919, was unsuccessful. All the symptoms became progressively worse. In May 1920 an operation was performed. The fever subsided after the first week. Recovery was gradual and complete and associated with a gain of 20 lbs.

Case 2. The patient was a man, aged 32 years, who developed cough and a rise in temperature with some hoarseness in December 1917. Symptoms of pulmonary and laryngeal tuberculosis were present with flare-ups in the temperature. Following operation in May 1920 the temperature remained elevated and the sputum profuse for six to eight weeks, but then slowly decreased to normal. The patient is well at the present time and his weight is normal.

Case 3. This patient was a woman aged 30 years. Active tuberculosis from the apex to the base of the left lung was diagnosed in 1918. The lung was collapsed and the symptoms disappeared. In June 1920 the patient returned with a relapse. As it was impossible to collapse the lung again thoracoplasty was performed. At the end of nine weeks the patient died from cardiac incompetency.

Case 4. The patient was a man aged 34 years. Examination revealed in addition to active tuberculosis with cavity formation in the left lung, weakness of the heart, a low blood pressure and a 4 plus Wassermann reaction. Operation was performed but the patient developed ascites and died of cardiac weakness.

The authors state that thoracoplasty should be performed only when the simpler artificial pneumothorax is found impossible. All cases should be carefully selected in regard to heart action and the condition of the opposite lung, as the operation causes sudden collapse of the affected lung and the burden is at once thrown upon the opposite side. Gas oxygen is the best anæsthetic and may be supplemented by procaine.

William J. Pickett, M.D.

Costantini, H., and Duboucher, H.: Cervico-

d'origine thyro-glosse probable. Thrombose après désarticulation et abaissement temporaire de la clavicule. Pneumothorax opératoire, ligature de la sous-clavière et de la vertébrale. Guérison.) *Bull. et mém. Soc. de chir. de Par.* 1921, xlvii, 1135.

In the case described operation was decided upon because of incessant vomiting and progressive weakness. The condition was diagnosed as a subclavian tumor of unknown nature which compressed the pneumogastric nerve and by this irritation caused complete gastric intolerance. The clavicle was dis-inserted, the pneumogastric nerve which was stretched over the anterior surface of the tumor, was disengaged and the jugular vein was ligated and sectioned. The tumor was found to involve the subclavian artery and the innominate trunk and was isolated with difficulty; the subclavian artery was torn and ligated. The apex of the lung had been completely destroyed but the operative pneumothorax did not cause complications. At the end of the operation the patient was in a very poor condition but ultimately made a good recovery. Histologic examination of the removed tumor suggested a thyroglossal origin.

Duval in submitting and discussing this report stated that in order to approach the subclavian fossa, the lower carotid region, and the lateral

region of the anterior mediastinum in cervicothoracic surgery it is necessary to supplement the exposure of the subclavian fossa by an incision above the sternocleidomastoid The extent of the resection of bone will vary according to the necessity for a greater or less descent into the mediastinum. With regard to the harmlessness of the surgical pneumothorax in the case reported he cited a similar favorable outcome following accidental operative pneumothorax reported from the Mayo Clinic by Hedblom. Duval believes that when severe complications follow an accidental operative pneumothorax it is best to transform the partial pneumothorax into a total pneumothorax and immobilize the lung by totally collapsing it W A Brennan

Schwyzer A : Notes on Surgery of the Mediastinum. *Ann Surg* 1922 lxxv 53

In preliminary remarks the author briefly enumerates pathologic conditions of the mediastinum inflammations and purulent infections resulting from direct trauma such as those due to a penetrating wound or œsophageal perforation and those due to direct extension or the breaking down of lymph glands tuberculous glands gummata Hodgkin's disease leukæmia simple hyperplasia or neoplasms of the thymus intrathoracic goiters aneurisms benign neoplasms, such as lipomata, chondromata fibromata and dermoids and malignant growths such as carcinomata sarcomata, and lymphosarcomata.

In one case Schwyzer approached the posterior mediastinum by resecting several ribs near the costovertebral articulation and stripping back the pleura He reports also two cases of purulent infection in the anterior mediastinum in which the disease focus was approached by resecting several ribs anteriorly over the region of infection. A case of aneurism of the innominate trunk was cured by ligation of the common carotid and subclavian arteries near the aneurismal sac. The patient has now been well for eleven years.

Another case cited was a case of spindle-celled sarcoma of the mediastinum operated upon by Marwedel in Czerney's Clinic in 1901 The growth was successfully removed and at the time the report was made the patient had been well for two years and two months.

At present, hope lies mainly in roentgen and radium treatment of malignant neoplasms of the mediastinum. In a case of mediastinal angiosarcoma considerable relief was obtained by the use of the X rays and 8 600 mg hrs. of radium.

The author reports the successful removal of a mediastinal fibroma by means of a collar incision in the neck a vertical incision over the sternum and partial resection of the sternum Positive pressure was used. In the closure of the wound the thoracic cavity was made air tight by suture of the subcutaneous tissue over the sternum and of the sternohyoid sternothyroid and sternomastoid muscles over the suprasternal region.

The differential pressure apparatus consisted of a Ben Morgan ether chamber or a large rubber bag connected with a foot bellows The ether chamber or rubber bag is connected also by a long rubber tube and a forked glass arrangement with two intranasal tubes which are inserted down to but not beyond the soft palate. The long rubber tube is broken by a T tube one arm of which is attached by a rubber tube to a glass tube about 1 ft long which is inserted in a tall glass and adjusted to extend 22 or 23 cm below the level of water in order to obtain approximately 17 mm. of mercury pressure. This latter serves as a manometer The bellows is pumped just sufficiently to produce a gentle bubbling of the water The anæsthetist regulates the pressure by closing the patient's mouth Ether vapor can be run into the system by a side tube *attachment connected with the ether bottle and* a rubber hand bulb A tightly fitting face mask may be used instead of intranasal tubes, but is not so efficient. The narcosis is smooth

The author agrees with Sauerbruch that local anæsthesia in its present form is unsatisfactory in intrapleural operations

Walter C Burket M D

Dick [illegible]

[illegible]

The breast which is intended to functionate as a secondary sexual organ is influenced by hormones, toxins and the psyche Hyperæmia is induced monthly by the ovarian secretion and if pregnancy ensues, the hormones activate the gland to further growth and the formation of colostrom which if reabsorbed determines the time of labor

The breast requires normal function and will tend to pathologic states of the tumor type if the natural cycle is interfered with. In certain persons [illegible] also in certain cases of metritis, parametritis, and ovarian tumors. At the menopause there is more or less change in the breast with an increased tendency to pathologic conditions.

Before the thirty fifth year of age the most common type of breast tumor is the fibroid. In some cases this produces bleeding from the nipple After the thirty fifth year the fibrous tissue grows into the breast substance, and the irritation so caused is sufficient to produce a blood-stained discharge.

The most common causes of bleeding from the nipple are papillomata proliferations of the duct linings In a number of cases the microscope showed that the cells at the base had begun to wander thus demonstrating evidences of malignancy

It is now believed by pathologists that tumor formation in the mammæ is a type of chronic inflamma

tion. Curiously, the left upper outer lobe is the part most apt to be the site of chronic interstitial change

The wandering cell produces local inflammatory reaction, with the formation of fibrous tissue. If

beginning malignancy The benign condition is apt to be only temporary We have not as yet a definite plan of attack for benign tumors some surgeons resect in part, some do a complete plastic subcutaneous resection and others a radical removal C H DAVIS, M D

Stetrunk, W E., and MacCarty, W C.: Life Expectancy Following Radical Amputation for Carcinoma of the Breast: A Clinical and Pathologic Study of 218 Cases. *Ann Surg* 1922 lxxv 6

The factors which seem important in determining the expectancy of life were carefully studied from a clinical and pathologic standpoint in a series of 218 cases of carcinoma of the breast operated on in the Mayo Clinic One of the most important questions in the whole subject of cancer is why some patients live longer than others who have grossly the same or less amounts of local or general cancer

Of the series of 218 patients, 2 7 per cent died within six months 21 1 per cent, within one year 34 9 per cent within two years 42 2 per cent *within three years 49 1 per cent, within four* years and 55 per cent within five years Only 2 3 per cent died after five years After eight years the disease rarely recurs

Carcinomata which developed during pregnancy or the lactating period invariably proved fatal within five years after operation Diffuse carcinomata which involved practically the entire breast caused death in every instance within five years all but one of the sixteen patients with this type of growth died within three years after operation When the axillary glands were involved, carcinomata around the nipple proved fatal in seventeen of eighteen cases (94 5 per cent) within five years Seventeen of twenty patients with ulcerating carcinomata (85 per cent) were dead at the end of seven years fourteen died within five years after operation

Age seems to have a definite bearing on the results to be expected following operation Forty-one and seven tenths per cent of the patients over 50 are alive from five to eight years after operation,

138 are dead the specimens of ninety-one of these patients were studied from the standpoint of cellular differentiation, lymphocytic reaction, fibrosis, and hyalinization All pathologic specimens were studied independently of the clinical histories From the facts found in the study of these ninety one cases the authors make the following generalizations on mammary cancer:

1 Cellular differentiation occurs in 15 per cent.

2 Local lymphocytic infiltration occurs in 62 per cent.

3 Local hyalinization occurs in 54 per cent

4 Local fibrosis occurs in 71 per cent

5 Lymphocytic infiltration and fibrosis occur in 41 per cent.

6 Lymphocytic infiltration and hyalinization occur in 28 per cent.

7 Hyalinization and fibrosis occur in 52 per cent.

8 Lymphocytic infiltration hyalinization, and fibrosis occur in 28 per cent.

9 The average length of postoperative life of patients with lymphocytic infiltration alone is 28 per cent greater than the average length of post operative life of the patients in this series.

10 The average length of postoperative life of patients with lymphocytic infiltration, hyalinization, and fibrosis is 37.8 per cent greater than the length of postoperative life of patients in this series.

12 The average length of postoperative life of patients without lymphocytic infiltration, hyalinization

greater than the average length of postoperative life of the patients in this series.

14 The average length of postoperative life of patients with fibrosis is 7 per cent greater than the general average length of postoperative life of patients in this series It is also 42 per cent greater than that of patients without fibrosis.

15 The average length of postoperative life of patients with lymphocytic infiltration and hyalinization is 44 per cent greater than the average length of postoperative life of patients in this series.

16. The average length of postoperative life of patients with fibrosis and hyalinization is 71 per cent greater than the average length of postoperative life of patients in this series

From these generalizations it is concluded (1) that the three greatest single factors in increased postoperative longevity in this series of ninety-one cases

tion,

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main factor and (3) that while hyalinization and fibrosis appear to play individually some part in increasing longevity in cases of cancer of the breast the two when present in combination, constitute the greatest known defensive factor against the invasion of tissues by cancer cells.

TRACHEA AND LUNGS

Kaempfer L. G.: A Foreign Body in the Lungs Innocuous for Forty Years. *Am J Surg* 1922 xxxvi, 8

Kaempfer's case was that of a widow aged 58 years who had been in perfect health up to a few months before her death but then developed a cough and later symptoms and signs which led to a diagnosis of bronchitis. Her condition became worse and three weeks before death a diagnosis of lung abscess in the lower right lobe was made. An X ray plate showed an opacity in the lower right chest and also a well-defined shadow about 3 in long and with parallel edges ½ in. apart in a vertical position just to the right of the bodies of the vertebræ and merging its lower margin in the less dense shadow of the lower chest. This shadow was believed to be that of a foreign body which probably was the cause of the lung abscess. However, it was very difficult to reconcile this assumption with the fact that a foreign body of such size could not have been inhaled by an adult unconsciously, that such a foreign body would first lodge in one of the larger bronchi and thus lie in the direction of the bronchus rather than in a vertical position and that repeated bronchoscopic examinations had not revealed it. A thoracotomy was decided upon, but the patient suddenly went into collapse and died.

At autopsy a large empyema cavity containing [illegible] from both the gangrenous portion of the lung and the empyema cavity and apparently completely walled off was a slate pencil about 3 in. in length and ½ in. in width. The pencil cavity was separated from the mediastinum by lung tissue.

No scars were found in the œsophagus. From the appearance of the scar tissue around the pencil and the fact that the patient could not remember having aspirated any large foreign body the author concludes that the pencil must have been there for a very long time, probably since childhood. It apparently had no etiological bearing on the lung abscess. RALPH B. BETTMAN, M.D.

Hug, O.: Thoracoplasty and Scoliosis (Thorakoplastik und Skoliose) Stuttgart: Enke, 1921

In the first part of this monograph the author discusses the development and the present views regarding the surgery of pulmonary tuberculosis. After a short historical summary of the development of thoracic surgery he discusses the usual methods of operation: rib resection, pneumothorax, pneumolysis, pulmonary plugging, phrenicotomy and thoracoplasty. The operation for oil empyema fistulæ is also considered in detail.

The second part of the work deals with the phenomena in the thorax and spinal column following operations for pulmonary diseases. In this connection the severity of the operation, the patient's age, and the pliability of the bones are of importance. In every markedly developed case of pulmonary tuberculosis the concavity of the arch of the vertebral column is toward the disease focus if curvature of the spine develops at all. When pneumothorax treatment is given there is no curvature of the spine in fact, this treatment may overcome a deformity.

If a unilateral thoracic operation or phrenicotomy is done on a patient who is still growing, the more *rapid and stronger growth of the normal side* is a factor in the developing deformity. In every case the flattening and contraction of the thorax precedes the curvature of the spine. Efforts must therefore be directed toward preventing thoracic contraction. In extensive rib resections the muscular traction of the normal side is opposed only by the cicatricial complex of the collapsed and shrinking lung. This traction is not equal and the lung cannot be placed at rest. Of all the patients with severe scolioses who were examined subsequently by the author not one was clinically well.

Hug examined twenty-two patients who had been operated upon by Sauerbruch or Schreiber. The histories of these cases are given in detail. In forming an opinion of the results of operation the following facts must be taken into consideration: the duration of the disease previous to the operation, the kind of treatment given up to the time of the operation, the patient's age at the time of the first operation, the nature of the operation, the length of time that has elapsed since the operation, the postoperative treatment, the orthopedic measures and pulmonary findings at the time of the subsequent examination, the patient's ability to work, [illegible] In this connection the author gives a very detailed and interesting exposition of the development, [illegible] upper dorsal segment, the rachitic and the habit scoliosis are discussed. The site of the former is the lumbar portion of the spine and the adjacent dorsal vertebræ. Habit scoliosis is characterized principally by dorsal deflection. Several factors come into consideration in regard to its etiology, viz. [illegible] *activity during the whole period of growth consti-*

interest not only to the orthopedist and surgeon but also to the lung specialist, the hygienist and the pediatrician VON TAPPEINER (Z)

MISCELLANEOUS

Yamanoi, S.: Lipoma of the Thymus (Zur Lehre der Thymuslipome) *Zentralbl f Chir* 1921 xlviii, 785

This is the second case in the literature up to the present time Lange reported the first one Both were discovered at autopsy The author's case was as follows

The patient, a woman aged 42 years, died of uremia The pathologic diagnosis was secondary contracted kidney excentric hypertrophy of the heart general arteriosclerosis, chronic edema of the lungs, and congestion of the abdominal viscera. Just beneath the jugular incisura of the sternum was a tumor consisting of two lobes which extended bilaterally close to and behind the pericardium Its surface was smooth in many places, but in others it was distinctly and coarsely lobulated and light yellow Particularly in its lower parts the

and lower lobes of the lung was slightly adherent to the growth by fibrous adhesions.

Section showed the tumor to be distinctly lobulated and of the color transparency and consistency of fat tissue On microscopic examination it was found to consist almost entirely of lobulated fatty tissue with large round fat cells The lobules were separated from one another by small connective tissue septa containing blood vessels. In the middle of the lobules throughout the whole tumor were found small foci rich in large round to polyhedral cells with light nuclei poor in chromatin some of which were arranged irregularly and others forming typical Hassal corpuscles. Adjacent to them were small thymus elements resembling lymphocytes.

To determine whether this was a case of further development and fatty substitution of a thymus

years. In only two of these thirty three corpses,

elements. In eleven cases he found microscopically small lymphoid foci here and there in the fatty tissue some of which on close examination proved to be small lymph nodes and others small inflammatory infiltrations of lymphocytes

This almost negative finding does not favor the

[illegible] we must therefore assume as more probable that in these cases of lipoma of the thymus the fatty tissue begins to proliferate in an entirely normal thymus from causes unknown to us and is then drawn down into the deeper parts of the mediastinum with the remaining thymus elements

but it was stated in the protocol that in the body which was 162 cm long and weighed 55 gm a layer of light yellow fatty tissue 3 cm thick was discovered in the abdominal skin

VON LOBMAYER (Z)

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

La Roque, G P The Intra-Abdominal Operation for Femoral Hernia. *Ann Surg* 1922 lxxv 110

The author makes his incision through the skin, superficial fascia and aponeurosis just above the internal inguinal ring The fibers of the internal oblique and transversalis muscles and fascia are separated in the usual muscle-splitting fashion to expose the peritoneum The peritoneum is then picked up and opened in the usual way After

can then be completely and easily separated and this region of the abdomen thoroughly explored

With the finger or a pair of blunt curved forceps inserted in the hernial sac from above, enucleation is effected with the aid of a gauze-covered finger externally or sharp dissection is done the femoral and other large vessels being quite safe from injury After the sac is freed it is turned inside out into the peritoneal cavity The sac and redundant peritoneum in the region are pulled well upward clamped sufficiently high to take up all the redundant peritoneum, and excised. In this way the entire sac and from 1 to 2 in of the surrounding proximal peritoneum are removed The cut edges of the peritoneum are then sutured.

The author has found it advantageous to tack the sutured portion to the position of the internal inguinal ring and to the edges of the original incision in the peritoneum. This, he believes, effects practically a transplantation of the peritoneum away from the region of the femoral orifice and brings the raw surface of sutured peritoneum

out of contact with the bowel and omentum. The split muscles are then loosely sutured and in a hernia of small size this is perhaps all that is necessary When the hernia is large the under surface of the aponeurosis is caught with sutures placed very loosely as if to close the inguinal canal La Roque cautions against tying the sutures tightly The femoral canal or orifice he leaves open Of twelve cases of femoral hernia treated in this manner none has recurred. The first one was operated upon over five years ago E. C ROBITSHEK M D

GASTRO-INTESTINAL TRACT

Reynolds, L. and McClure C. W: Motor Phenomena Occurring in Normal Stomachs in the Presence of Peptic Ulcer and Its Pain As Observed Fluoroscopically *Arch Int Med* 1922 xxix 1

The authors report on fluoroscopic observations of the stomachs of normal men and of persons with ulcer of the stomach or duodenum. The purpose of the study of the cases of ulcer was to obtain detailed information regarding gastric motor phenomena occurring throughout the period in which the stomach was emptying itself and during the occurrence of pain due to the presence of the ulcer also to establish an objective method for determining the effect of therapeutic measures. The normal persons were studied to obtain further data as to normal motor activity

All subjects were fed one type of meal There were five normal subjects and sixteen patients with peptic ulcer Fluoroscopic observations on the normal human stomach after the ingestion of finely divided meat mixed with barium showed that it emptied itself in a regularly progressive manner Peristaltic waves began high up in the gastric walls at uniform intervals of about twenty seconds and gradually deepened their progress in an orderly manner to the region of the pyloric sphincter As each wave approached the sphincter the latter opened allowing the ejection of chyme into the duodenum for a period of about ten seconds. The subject being in the reclining position one of the normal stomachs emptied itself in five hours Three of the normal stomachs were almost empty in five hours Under the conditions of the observations here reported a very small residue remained along the greater curvature of these stomachs for a longer period. The stomach of the fifth subject contained a moderate amount of residue at the end of seven hours.

Abnormal phenomena observed in the stomachs of patients with duodenal or gastric ulcer were modifications of the motor activities of the stomachs of normal persons. The abnormalities noted were (1) an exaggerated type of normal gastric per
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stationary spasm of the gastric musculature causing the so-called incisura (5) gastric antiperistalsis (6) delayed emptying time and (7) very rapid emptying With two exceptions, the onset of pain was accompanied by modifications in whatever type of motor activities the stomach had manifested previously The various abnormal motor phenomena were observed in the stomachs of peptic ulcer patients who did not develop pain during the period of observation

This discussion shows therefore that no motor phenomena are peculiar to the occurrence of the pain of peptic ulcer that at present no accurate means is available for measuring the degree of spasm of the gastric or sphincteric musculature and that there is almost no support for the distention theory proposed by Hurst

In view of these facts there is no incontrovertible proof that the pain of peptic ulcer is the result of motor disturbances in the stomach and pyloric sphincter The most satisfactory evidence in support of the theory that such motor disturbances are the cause of the pain of peptic ulcer is that the observations showed that gastric or sphincteric motor disturbances are almost invariably associated with the pain But these observations do not furnish conclusive proof of the truth of this theory and for this reason it must be admitted that the causal relation of motor phenomena to the pain of peptic ulcer remains problematical

From the clinical standpoint the most important feature of the work here presented is the fact that the usual disappearance of abnormal motor phenomena occurring simultaneously with the cessation of pain gives an objective means of judging the effects of therapeutic measures

GEORGE E BEILBY M.D

De Quervain F: A Consideration of the Relative Merits of Resection and Gastro-Enterostomy in the Treatment of Gastric and Duodenal Ulcer *Surg Gynec & Obst* 1922 xxxiv 1

The author studied the results of resection and
[illegible] cases of gastric and duo-
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of the general indications for operation and the decision as to the best technique in a given case

Operation is indicated when stenosis or repeated bleeding endangers life and when medical treatment has been unsuccessful These limitations are mentioned because (1) many ulcers heal spontaneously or with medical treatment (2) in some cases even after operation the tendency to form ulcers remains (3) operation does not always effect a cure and (4) operation is accompanied by a certain risk and by certain sequelæ such as jejunal ulcer

Seventy per cent of the patients coming to the surgeon have had gastric disturbances for from five to thirty years, and a large proportion has been given systematic non surgical treatment without improvement

The rôle of hydrochloric acid in the diagnosis has been over-emphasized as the number of cases of ulcer showing normal or subnormal acidity far exceeds the number with hyperacidity Hyperacidity was present in two-fifths of the cases of

sign indicating the absence of carcinoma. Lactic acid was not discovered in any case of ulcer which was found to be benign at operation. This test when positive is of far more importance than the hydrochloric acid test. Occult blood in the stools was found in only 50 per cent of the cases of gastric ulcer and in 65 per cent of the cases of duodenal ulcer It is seldom absent in cases of gastric carcinoma.

Of 100 cases of ulcer of the lesser curvature 72 showed definite niches There was a six hour retention in about one half the cases In the cases of duodenal ulcer localization was possible in 54 per cent and definite niches were seen in only four

In 6 per cent of the cases a positive differentiation between benign ulcers and carcinoma could not be made at operation and the diagnosis was possible only on histologic study Carcinomatous degeneration in an originally benign ulcer was demonstrated in 1 4 per cent of the cases and multiple ulcers were present in 9 3 per cent

The operative mortality of gastro-enterostomy was 6 5 per cent and that of resection 7 7 per cent. The most frequent cause of postoperative deaths is a lung complication such as embolism, pneumonia, or gangrene The danger of the complications depends more upon the extent of the operation than upon the anesthetic In two cases with vicious circle which were operated upon favorable results were obtained Jejunal ulcer was seen in eight of the author's cases and twelve times in cases of primary operation elsewhere Since the adoption of absorbable suture material in 1917 only one case of jejunal ulcer has been seen

In a study of late results it was found that 90 per cent of recurrences, jejunal ulcers, and other disturbances occur in the first four years after operation hence statistics based upon results reported earlier than four years after operation are apt to be too favorable. In all forms of gastric ulcer simple gastro-enterostomy produces somewhat more than 80 per cent of early cures or improvement approximating a cure Observations made over longer periods show about 75 per cent of cures. Radical operations show a similar early result with about 80 per cent of cures

The sleeve resection is very satisfactory and has given a cure in 90 per cent of cases The V-shaped excision is unsatisfactory The end results of the Reichel-Polya operation are yet to be reported The X-ray after gastro-enterostomy showed complete disappearance of Haudek's niche in six cases and its partial disappearance in two cases

In cases of duodenal ulcer gastro-enterostomy with or without the von Eiselsberg exclusion yields 65 per cent of cures. Resection yields better end results in favorable cases of gastric or duodenal ulcer than gastro-enterostomy Under unfavorable circumstances greater benefit is derived from a well performed gastro-enterostomy

CLAYTON F ANDREWS, M.D

Easterman, G B., and Senty E. G.: Benign Tumors of the Stomach; Report of Twenty Seven Cases. *Surg Gynec & Obst* 1922 xxxiv 5.

The twenty-seven cases reported were observed in the Mayo Clinic between 1907 and 1921 During this period 2 165 malignant tumors of the stomach were operated on. Of all neoplasms coming to operation 1 3 per cent were benign. Seventeen were classified clinically as primary growths because they were found to be the chief cause of the patients complaint The tumors included myomata of various types, fibromata, hæmangiomata dermoids, polypi, an adenoma and polyposis.

The sexes were about evenly represented The patients ages ranged from 8 to 67 One-half of the patients were more than 40 years of age In thirteen cases the tumors were in close proximity to the pylorus. In five they were on the posterior wall, in five on the anterior wall and in two distributed

tumors were symptomless. Seven patients had palpable tumors The average weight loss was 25 lbs. Ten patients had recurring hæmorrhage and associated anæmia and weakness due chiefly to ulceration or erosion of a portion of the tumor Three of the four patients with angiomata had severe bleeding and anæmia Seven patients had obstruction including one with a fibroma on the posterior wall of the stomach which had caused intussusception of the wall into the duodenum. In several cases in which a tumor near the pylorus had a ball valve action there were severe painful seizures simulating gall-stone colic. Myomatous tumors of the pylorus, with or without pyloric obstruction, caused a syndrome similar to that of duodenal ulcer The larger tumors could not be distinguished from carcinoma by the X ray

The evidence in cases of benign tumors of the stomach favors the diagnosis of gastric cancer but a palpable mass, food retention, and six-hour barium retention are less frequent than in carcinoma. Often patients with benign gastric tumors are refused operation because the condition is re

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Masson, J C : Cancer of the Stomach *Canadian M Ass J* 1921 xi 924.

Thirty-eight per cent of the deaths from malignant disease are due to cancer of the stomach The first attempt at surgical removal was undertaken by Péan in 1879 If operation is done early a cure may result if the disease is limited to the stomach, and even when secondary involvement has taken place life is lengthened.

From the point of view of complete cure it is probable that cancer of the stomach is surgically the most favorable type of internal cancer The author believes that the attitude of pessimism and indifference is due to the high operative mortality and the short life expectancy after radical surgery on patients who come to operation too late The [illegible] with regard will bring a

Most cases are curable if radical treatment is carried out when the symptoms first appear or when the patient first comes under medical observation. The only exceptions to this principle are growths close to the cardia. These however, comprise only about 6 per cent of gastric neoplasms The most the surgeon can expect in late cases is to relieve obstruction and prolong life for a few months or possibly a year or two

Of 1,912 patients operated on for carcinoma of the stomach at the Mayo Clinic from January 1 1910 to January 1 1921 1 500 (78.45 per cent) were males and 412 (21 54 per cent) were females. The average age was 53 7 years.

Social environment, occupation and the use of tobacco or alcohol do not have a decided influence on the production of cancer of the stomach A large percentage of the 1,912 cases of cancer were those of farmers and farmers wives. Constant overeating, probably more common in rural communities than in cities especially of coarse hot or improper foods, may cause mechanical irritation or upset the chemistry of the stomach Trauma is undoubtedly the most important etiological factor in the production of cancer in any organ. This may be mechanical, chemical, parasitic, or biochemical, and is especially dangerous if continued over a long period of time. By feeding rats with parasitically infected foods Fibiger was able to produce new growths of a cancerous nature. External trauma may be responsible for bringing a latent process into activity On the other hand, sarcomata are probably often caused by a single injury [illegible] of persophagus throat are responsible for a large number of gastric ulcers. Masson believes that in a large percentage of cases ulcerative [illegible] stomach are tube actinom in doubt

The symptomatology of gastric cancer is very complex The cases may be divided into two main groups (1) those with a long history of gastric disturbance typical or atypical of gastric ulcer with the recent development of malignancy and (2) those without a previous history suggestive of benign ulceration Definite symptoms upon which an early diagnosis of cancer of the stomach can be based are still unknown By early cases the author means those considered benign clinically and in which removal of tissue gastric ulcer [illegible] years malignant changes were found by the pathologist in 253 (18.07 per cent)

A tumor of sufficient size to be palpated must be of several months duration, but many of these are still confined to the stomach and many five-year cures are obtained by operation Operation saves also an even larger number of patients from death by starvation due to gradually increasing obstruction Such persons enjoy from one to three years of comparatively good health and die a slow death from cachexia without much pain

The examination of a patient with a gastric complaint is not complete without thorough roentgenographic studies As the number of reliable roentgenologists increases the number of early operations for cancer will increase and there will be a corresponding decrease in the mortality statistics of this disease Modern roentgenologists are able to discover about 95 per cent of gastric tumors, and are of great aid in determining their operability The roentgenologist must frequently decide whether an ulcer is in the stomach or duodenum. This is important because duodenal ulcers rarely become malignant while the tendency for gastric ulcers to become malignant is beyond dispute

The differential diagnosis of malignancy of the stomach presents many difficulties. This is due no doubt to the fact that early cancer of the stomach in itself does not cause symptoms on which a diagnosis can be based The author believes that the only cases in which a reasonably early diagnosis can be made are those with a history of gastric ulcer The only patients with a good chance for cure are those on whom operation is performed before this change is noted clinically and in whom malignancy is found in only a limited area of the mucous membrane at the edges of a typical peptic ulcer The percentage of gastric ulcers that become malignant will never be known

Gastric cancers are of four types (1) scirrhous, (2) medullary (3) ulcerating and (4) colloid.

A surgeon is not consulted in most cases until digestive disturbances are marked and very often not until pain is severe obstruction is noted or a tumor can be palpated The condition is associated with more or less marked anæmia, loss of strength and weight nausea anorexia, and blood changes Hematemesis or melena occurs probably in one-third of the cases.

The gastric contents especially in cases of obstruction, show abnormal chemistry occult blood, and

two-thirds of the cases the tumor can be palpated and from its position and degree of mobility valuable

fluid may be present

The author lays stress on the fact that so many

later if obstruction develops, advise palliative surgery On the other hand, if surgeons neglected their duty to their patients and considered only the appearance of their mortality sheets, they would operate on fewer patients and have a much higher percentage of cures

rhage occurs in 25 to 33 per cent of cases, and perforation in 4 per cent Metastasis occurs early in some cases and relatively late in others The amount of involvement of the lymph glands and liver is frequently out of all proportion to the size or apparent age of the local growth in the stomach

In all early and questionable cases surgery is indicated If the hemoglobin is below 40 a preoperative transfusion of 500 to 700 c cm of blood should be given and also if indicated regional or combined anesthesia

In conclusion the author urges that surgical diagnosis be made early in all suspected cases of cancer of the stomach that special stress be laid on malignant changes in benign ulcer that surgeons accept the responsibility and perform laparotomy before the patient's condition is such that it permits only palliative surgery and that the laity be educated to the fact that cancer is curable in many cases if an early radical operation is performed

J E Stauffer, M D

Walker I J Jejunostomy *Boston M & S J* 192 clxxvi, 08

The following are some of the indications for jejunostomy (1) carcinoma of the oesophagus (2) ulcer of the cardiac end of the stomach where removal is impossible (3) obstruction of the pyloric end of the stomach due to cancer or ulcer (4)

with localized peritonitis and (7) intestinal obstruction

retaining catheter about No 16 French, in size

Any case of obstruction in which the vomiting comes from the small intestine calls for opening of the bowel at the jejunum and not at any lower point. Early complete obstruction of the large bowel can be relieved by colostomy or ileostomy In toxic paralysis of the bowel due to general peritonitis jejunostomy is more or less futile.

Jejunostomy is a simple surgical procedure by which intestinal gas and toxic material can be evacuated in cases of obstruction and through which nutriment drugs and fluids can be introduced

Carl R. Stephan, M D

Léri A. and Deschamps, P N: Typhoid Perforation of Meckel's Diverticulum (Perforation typhoïdique d diverticule de Meckel) *Bull et mém Soc méd d hôp de Par.*, 1921 xlv 1554

The case reported was that of a woman 22 years of age Death occurred without signs of perforation of the intestine but autopsy revealed peritonitis due to a perforation of Meckel's diverticulum. Histologic examination showed typhoid infection.

The authors have found only four similar cases in the literature. They explain the absence of symptoms of peritonitis by the fact that because of its location the diverticulum was covered by the mass of the intestines which separated the lower pelvis from the large peritoneal cavity and thus localized the infection

In all reported cases of typhoid perforation of Meckel's diverticulum the lesion has been found in the apex of the diverticulum. This is due to the *fact that the extremity of the diverticulum lacks a* muscular coat the mucosa being in direct contact with the serosa W A Bastian

Sheldon, J G., and Heller E. P: Rectal and Vesical Incontinence Relieved by Operation. *Ann Surg* 1922 lxxv 89

The case reported was that of a boy 12 years of age who was born with an imperforate anus and had no control of the bladder The anus was operated upon four times two operations to fix the anal

gluteus maximus with its nerve supply (the inferior gluteal nerve) was freed on each side down to and including the periosteum where the muscle is

attached to the femur below the great trochanter Each strip was then tunnelled around the rectum and the periosteal ends were stitched together posteriorly after they were crossed anteriorly In this manner a circle of muscle was formed around the rectum A rubber drain was inserted for twenty four hours. At the end of the fourth week the patient had control of the bowels during the day and gradually the control became involuntary The sphincter contracts independently of the remaining portions of the gluteus maximus.

A second operation was performed June 17 1921 to correct the vesical incontinence. The urachus was found to be patent up to within 2 in of the umbilicus, and both hypogastric arteries were pervious and of good size These three structures of the peritoneum f the fundus of the well down into its

proper position in the pelvis and a circumcision was performed On the second day the patient was able to retain 25 to 50 c.cm. of urine On the fifth postoperative day there was almost complete control of micturition and an increase in the retention capacity of the bladder to 300 c.cm. Since his discharge from the hospital on the eleventh day the patient has had no recurrence of the enuresis. The cause of the urinary incontinence was believed to be the form and position of the bladder The operation is shown by six plates.

In view of the operative findings and the result obtained in this case the authors conclude that the position and shape of the bladder should be determined in all cases of urinary incontinence.

Regarding the rectal operation they state that the fibers of the gluteus maximus should not be severed but should be detached with the periosteum at the site of insertion on the femur the muscle flap should be ample at least an inch in diameter even in the cases of children and if possible the nerve supply of the muscle flap should be investigated and retained even if a large portion of the muscle must be incorporated in the flap.

CARL R. STEINER, M.D

Kaiser F J : A Continent Artificial Anus. A New Method: A Femoral Artificial Anus (Ueber kontinenten Kunstafter Eine neue Methode Anus praeternaturalis femoralis) *Beitr z. klin Chir* 1921 cxiv 548

The application of pads in cases of artificial anus has not undergone any improvement worth mentioning even with the modern advances in the methods, wearers of these pads still suffer much discomfort from intestinal contents and gases. Kaiser therefore attempted to form an artificial anus under muscular control All of the methods already in use to obtain continence at the intestinal outlet were based on four principles (1) the plastic construction of a closure apparatus of living tissue (2) the bending of the intestine before its place of exit (3) the mechanical narrowing of the intestinal passage and (4) the formation of an artificial sphincter Kaiser devised a femoral artificial anus which he claims is a decided improvement This is made as follows

The abdominal cavity is opened in the left hypogastrium by means of a typical muscle-splitting incision and it is then decided whether or not the sigmoid flexure is suited to the proposed operation that is whether it is long enough and free from adhesions and whether it shows any other changes such as carcinoma metastases If all the conditions are favorable the loop is divided at the end nearest the anus and both the afferent and efferent ends are aseptically closed. The mesosigmoid is then divided the efferent loop is lowered into the abdominal cavity and the mobile afferent loop of the sigmoid is brought under the skin and the upper part of the sartorius muscle The region of the inguinal furrow and he uppermost part of the ctorl muscle i

If possible the closed segment of intestine is kept closed for a few days to favor healing of the wound and then a tube is introduced and the intestinal contents are evacuated with care not to contaminate the wound

This method has been successful in practically all of the author's cases The function is perfect and begins soon after the operation The procedure has the following advantages over other methods (those of Schmieden Maydl, Payr) (1) simplicity (2) the utilization of the passive tension of the sartorius muscle for compression of the intestinal lumen in addition to its active influence (3) the situation of the artificial anus in front, (4) the possibility of applying a pad which will hold firmly and can be raised without inconvenience (5) the early development of the sensation of need to defecate (6) the possibility of combining this method if desired with other aids in obtaining continence (7) the absence of intestinal prolapse and (8) permanent patency of the artificial anus CRILE (Z)

Goldschmidt, W : A Substitute for the Sphincter in the Formation of an Artificial Anus (Sphinkterersatz bei Anus praeternaturalis) *Zentralbl f Chir* 1921 xlviii, 961

Goldschmidt's method of forming a continent artificial anus is as follows

After a colostomy has been performed in the usual manner and the peritoneal cavity has been closed off muscle fascia and skin are sutured around the protruding intestinal end part of the suture including the peritoneum In the region of the afferent end that is at the site of the future artificial anus

sides. From these strips two skin tubes are formed to enclose the future anus, and through them a rub-

ber drainage tube is passed. By means of compression the drainage tube is made to serve as a sphincter

ne Since within a of obser refore tin- tte would

have continued to function if the patient had lived

Dorcas (Z)

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Graham, E. A. and Peterman, M. G.: Further Observations on the Lymphatic Origin of Cholecystitis, Choledochitis, and the Associated Pancreatitis. *Arch. Surg.* 1922, iv, 45

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However one route between the appendix and gall-bladder which is comparatively direct is a "hematolymphatic" route, there being a very intimate lymphatic connection between the liver and gall-bladder. An infection of the liver would tend to spread to the gall-bladder by way of the lymphatics and conversely an infection of the gall-bladder would tend to spread not only to the liver but also along the common duct to the pancreas. In this respect infections in this region would merely follow the rule of infections elsewhere in the body. In cases of cholecystitis there is also an associated inflammation in the liver. When this occurs secondarily to cholecystitis the right lobe of the liver is very much more affected than the left lobe, and the most marked changes are in the right lobe near the gall-bladder.

The authors explain the frequent association of appendicitis with cholecystitis on the basis of a primary infection of the liver from the appendix by way of the portal vein and of a cholecystitis result

of cholecystectomy rather than cholecystostomy because by this means the vicious circle can be broken most readily.

The paper is splendidly and instructively illustrated. Morgan H. Kane, M.D.

Friedman, G. A.: Tender Pressure Points with So-Called Symptomless Gall-Stones. *J. Am. M. Ass.* 1922, lxxviii, 187.

It is the author's opinion that many cases of

attacks of pain, (3) those who are free from pain

absent from the region.

The patients in Group 2 may exhibit all the symptoms of chronic peptic ulcer but the possibility of gall-bladder disease may be vaguely

gall bladder has been removed.

In searching for these tender points, equal force must be applied on either side, especially in the cases of neurotic women. Their discovery in the

in these nerves is not severe enough to cause pain, but *reaction* occurs on pressure.

The eliciting of tender spots in the areas mentioned is not new in cases of gall-bladder disease, but they are hardly ever searched for in cases of dyspepsia presenting no symptoms referable to the gall-bladder. William J. Pickett, M.D.

Behr—

Behrend describes a novel operation for the relief of chronic jaundice, viz. lateral anastomosis of the common bile duct with the stomach.

The pentoneal surface of the two structures are first united with linen thread The common duct is then cut across its long axis and a corresponding incision is made in the stomach The cut ends are united as in any other anastomosis.

In the case reported a large amount of bile was vomited during the first twenty four hours after the operation, proving that the anastomosis was successful. Within twenty four hours there was a marked decre
hours it hac
ceased after t
bonate solut
recovery and although at times she experiences slight indigestion she is usually able to eat any kind of food. C. Corbin Yancey M D

Mayo C. H : Jaundice from Pancreatic Disease. *Minnesota Med* 1922 v 6

In a consideration of jaundice due to pancreatic disease it is necessary to elliminate cases of hemolytic icterus and those in which obstruction of the common duct is due to stone. Ducts empty into a viscus by an indirect route, usually by passing obliquely through its wall an arrangement that provides for valve like action and prevents back flow A circular muscle usually guards the exit. The common duct in its course grooves the head of the pancreas, passes obliquely through the wall of the duodenum and just before entering the cavity of the bowel is joined by the pancreatic duct of Wirsung

Jaundice is due to the presence of bile in the blood and is caused by any condition which interferes with the delivery of bile into the intestine That absorption occurs by the lymphatics has been proved *experimentally* because jaundice does not occur if the chyle duct is ligated before the common duct.

The cause of jaundice may be a lesion anywhere in the biliary
lying factor
The associati
subject to certain variations. They may have separate openings into the duodenum, the duct of Santorini may be larger than the duct of Wirsung or the two pancreatic ducts may fail to anastomose in the gland Is it possible that the union of the biliary and pancreatic ducts renders the pancreas more vulnerable to secondary infection following infection in the gall bladder and ducts? The function of the liver is essential to life While the presence of bile in the intestine has a definite physiological purpose, its obstruction and resulting retention is not of itself a cause of death, though its absence may be a cause of serious discomfort.

As the pancreas partially or completely surrounds the biliary duct, any change in the gland caused by inflammation, sclerosis or new growth may be the cause of obstruction and jaundice The frequent association of inflammation in the pancreas with infection in the gall bladder makes this of considerable practical moment, and in all operations on the gall bladder and ducts the size of the lymph glands and the duct and the condition of the pancreas should be recorded for future reference in case of recurrence of the disease Insofar as digestion is concerned the pancreas has a relatively large factor of safety because experimentally a large part of the gland may be destroyed without seriously interfering with digestive processes Mayo believes that acute inflammation of the pancreas should be considered a chemical change due to toxemia from the alimentary intake The subacute and chronic forms are also chemical but result from microbic action Operative experience further indicates that most of the chronic diseases of the pancreas and a few of the acute diseases are secondary to infections in the gall bladder and ducts In a small group of cases of acute and chronic infections the lesion is primary in the pancreas.

Disease of the gall bladder is the result of chronic infection of its tissues. Mayo believes that the infection is carried to the gall bladder by the blood stream and results in septic infarction of the capillaries. It is probable that infection reaches the pancreas in like manner although the gland may be involved secondarily through the duct association The pancreas is usually the cause of the trouble when the gall bladder is found greatly distended without obstruction in the cystic duct The usual types of pancreatitis are

1 Intralobular Involvement of the outer part of the lobules produces a lumpy irregular enlargement of the head or of all the gland and only in advanced disease affects the islands of Langerhans.

2 Interacinar A diffuse enlargement of the gland occurs and frequently involves the islands glycosuria is often present This type may produce *abscess* or *fat necrosis.*

3 Hæmorrhagic. This type occurs as an acute abdominal lesion often associated with acute gall bladder disease and jaundice or cysts of the pancreas. It is caused by bile in the pancretic ducts

cer of the head of the pancreas may produce these symptoms

The symptoms of obstruction to the bile duct due to the pancreas are jaundice, pain indigestion loss of weight and strength, acholic and fatty stools, a

flammatory conditions of the pancreas. The syndrome of jaundice and a greatly distended gall bladder occurring in middle or old age is usually due to malignant disease of the pancreas. In these

cases symptomatic relief is afforded and life may be prolonged preferably by cholecystoduodenostomy or cholecystogastrostomy which short-circuits the delivery of bile

Jaundiced patients should have special pre-operative preparation consisting of blood transfusions and the intravenous administration of

Hitzrot J M : The Surgical Treatment of Pernicious Anemia *Ann Surg* 1922, lxxv 31

infection and splenectomy

The quantity of blood to be transfused is still a question for discussion In Hitzrot's experience, frequently repeated small or moderate transfusions have been as successful as larger transfusions and are less apt to cause unpleasant reactions in the donor or the recipient

Focal infections should be eradicated but only organisms which have definite hæmolytic properties can be considered etiological agencies In none of Hitzrot's cases was any organism grown from the spleen, and in only one case, in which there were a few suspicious teeth were any foci of infection discovered

case the operation was performed too recently to warrant a conclusion as to the outcome

The position of splenectomy as a therapeutic measure in cases showing increased blood destruction is as yet unsettled If the spleen is felt, its removal is indicated definitely If the percentage of cells taking the vital stain is abnormally large splenectomy should be considered If the percentage of reticulated cells in the blood is less than normal blood transfusion should be done If this increases the number of the reticulated cells, it increases the indication for splenectomy If the cells are not increased by this means, splenectomy will not help In the author's experience the reticulated cells are of more significance than the platelets

Cases which show improvement following a transfusion and do not return to the previous low ebb seem to be benefited by splenectomy Splenectomy is contra-indicated in the cases of elderly persons and those with spinal cord symptoms and in the plastic cases

Hitzrot urges early splenectomy If it is to be done at all

CARL R. STEINER, M D

chir 92 xxv 112.

clear leucocytes. In addition, the liver is slightly

The authors believe that splenectomy is definitely

pathology found in the organs removed at operation corroborates the accuracy of Banti's statement that the splenic lesion is primary

LOYAL E. DAVIS, M D

SURGERY OF THE EXTREMITIES

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Lewin, P : Osteitis Deformans (Paget's Disease), with a Report of Three Cases. *J Bone & Joint Surg* 1922 iv 45.

The author presents a report of three cases of osteitis deformans with a review of the disease from the time of Paget in 1876 to the present day

Osteitis deformans or Paget's disease is a syndrome characterized by minor subjective symptoms but important objective findings of deformities chiefly in the skull and long bones. The disease occurs in late middle life

In literature it is designated by various terms such as :

localized
sclerosis.

as Paget s disease as it was described by Sir James Paget in 1876 who was unaware that it had been described as early as 1697 by Malpighi

In the literature up to 1901 sixty-one cases were reported In 1910 about 100 cases were found The literature to date contains about 251 case reports.

The average age of onset was 48¼ years. Males seem more predisposed to the disease than females Heredity played a part in about 7 per cent of the cases reported. Race offers no predisposition. Many theories have been advanced as to exciting causes. The most important are as follows

1 Syphilis Paget did not regard syphilis as an etiological factor He believed a chronic inflammatory process was the cause. Wassermann tests today are usually negative and anti-syphilis treatment is of no avail

2 Chronic infection This theory had its advocates but Da Costa Funk and others attempted to make a vaccine and failed

3 Neurotrophic disturbances. Various writers have advanced evidence to support this theory The author believes that disturbances of the nervous system may be the underlying cause of a disturbance in metabolism

4 Endocrine disturbances No conclusive evidence has been offered to establish a relationship between Paget s disease and the endocrine system

5 Metabolic disturbances Metabolism studies have revealed a retention of calcium magnesium and phosphorus and a pronounced loss of sulphur These findings have been interpreted as indicating a stimulated osseous or osteoid formation associated with the absorption of a highly sulphurized organic matrix.

The pathologic changes are chiefly in the bones and may be generalized or local The deformities most commonly found are outward and forward bending of the tibia and next most frequently similar bending of the femur The joints are very seldom involved Deformity is frequently noted in the lower extremity The involvement is usually symmetrical, although cases have been reported in which the disease was limited to one half of the skeleton.

In some cases the skull is involved The entire thickness is composed of finely porous bone with a thin inner and outer plate of harder bone The diploe is lost Microscopically the porous substance consists of a network of thin bony processes. The haversian canals are confluent as a result of absorption forming Howship s lacunæ. Scattered areas of newly formed bony tissues are evident. The new osteoid substance remains uncalcified or is reabsorbed The result of this regeneration and absorption is total destruction of all symmetry in the internal architecture of the bones. In long bones the normal relation of compact and cancellous structure is destroyed The outer wall of hard bone consists of thin, irregular plates lying directly under the periosteum.

The author states that Paget s disease appears to be a combination of osteoporosis followed by osteosclerosis that the condition begins as an osteomalacia with softening due to the abnormal relationship between various chemical substances in the bone Osteosclerosis then supervenes and the cortex of the bone assumes a hard ivory texture

The onset of the disease is slow Vague rheumatic pains are described by the patient A gradual weakness of the lower extremities develops Tenderness is revealed by palpation of the long bones A gradual decrease in height may be noticed by the patient Bowing of the extremities is then seen The first symptom may be an increase in the size of the skull The head usually becomes flexed on the sternum A diamond shaped deformity of the abdomen can be observed

The X ray reveals a rarefying osteitis with a thickened cortex due to subperiosteal and new medullary bone formation This thickening occurs on the convex surface Bony striations may extend into the soft tissues Areas of rarefaction develop

The diagnosis is not difficult after deformity has occurred Differentiation must be made from syphilis, osteomalacia rickets bone tumors acromegaly and diffuse hyperostosis of the cranial bones

The prognosis is good as to life but poor as to cure Death usually occurs from intercurrent infection or malignancy

At present curative treatment is impossible Corrective treatment is inadvisable Medication is of questionable value The best hope today seems to be in phosphorus

The author reports three cases. He concludes his article by describing the unusual aspects of one case which manifested marked deformity of the right lower leg scleroderma, and fracture of the left forearm which showed non union after twenty years JOHN MITCHELL, M D

Nuzzi O Surgical Tuberculosis (Tuberculosi chirurgica) *Rassegna internaz de clin e terap* 1921 ii 440

In the different stages of its development surgical tuberculosis requires different methods of treatment Operation must be performed neither too early nor too late When the process is localized the body should be given an opportunity to mobilize its defenses but in some cases the removal of the bacterial focus is necessary to prevent the further spread of the condition The patient s age has a decided influence upon the evolution of the infection and should be taken into account by the surgeon in choosing the method of treatment It should not be forgotten that the natural tendency in cases of surgical tuberculosis is toward recovery

The purpose of orthopedic treatment is first to prevent malposition and ankyloses, and second to correct vicious positions The more economical operations are always to be preferred.

W A BRENNAN

Israel

Israel reports three cases of transverse paralysis of the spinal cord (one gunshot injury a fracture of the vertebra, and a spinal cord tumor) in which he found periosteal, peri-articular muscular and epineural ossification. He cites also cases from the literature. Similar cases suggesting myositis ossificans following cerebral paralysis of one extremity have been reported.

The ossification is limited to the paralyzed areas. The parts in which nerve function is intact are not involved. The condition differs from progressive myositis ossificans in that only the paralyzed areas in the limbs are involved. The development of the new formation often follows rapidly several months or weeks after the injury.

The author compares the changes described with the peri-articular ossification in the arthropathies following tabes and syringomyelia. His observations refute the theory that myositis ossificans is always the result of tabes and caused by excessive mechanical exertion of the muscles due to ataxia, as all of his patients were paralyzed and therefore were unable to move.

In regard to the histogenesis of these ossifications Israel states that he observed here and there distinct transitions of the connective tissue into bone due to swelling of its cells and homogeneous change of the interstitial substance into true bone. Therefore he agrees with those who assume a metaplasia of the proliferated connective tissue cells in the development of myositis ossificans. Possibly the connective tissue cells in the paralyzed area undergo extensive differentiation. In Israel's opinion the findings reported in this article demonstrate that there is a typical tissue reaction in the paralyzed limb.

von Redwitz (Z)

Bianchetti, C. F. **A Clinical and Anatomopathologic Contribution to the Study of Chronic Traumatic Hygroma** (Contributo clinico ed anatomo patologico allo studio dell igroma cronico (traumatico). *Policlin. Rome*, 92: xxvii, sez. chir., 485.

Bianchetti gives the complete history of two cases of chronic hemorrhagic bursitis and discusses the etiology, symptoms, and pathology.

The first case was that of a farmer aged 58 years. The tumefaction in the left gluteal region had been present for more than three years. It caused only a sensation of weight after work and the formation of numerous varices but did not interfere with walking. At operation a tumor the size of an adult's head was removed. The condition was diagnosed correctly before operation as a chronic ischiatic bursitis probably of hemorrhagic nature.

The second case was that of a farmer aged 54 years, who had been operated upon for bilateral inguinal hernia seven years previously. About two years later a painful tumefaction developed in the muscle.

According to Koenig ischiatic bursitis is produced by strain upon the nates in hard manual labor. The serous bursa from which the lesion originates is usually the bursa situated beneath the gluteus maximus and between this and the ischiatic tuberosity and the muscles inserted in it. Although such a situation is exposed to injury, cases of ischiatic bursitis are not numerous in the literature. In Bianchetti's second case the situation of the tumor corresponded to that of the bursa described by anatomists as a bursa of the psoas muscle; there may be two bursæ here, one between the muscle and the small trochanter and the other between the muscle and the anterior ligament of the capsule. In the case mentioned the hygroma developed at the expense of the upper bursa.

In the first of the two cases described the condition might have been due to trauma. In the second this etiological factor could be ruled out and the only explanation for the condition is that following the previous hernia operation a thread of silk migrated deeply and caused a chronic inflammatory process in the perivascular tissue which ultimately spread to the contiguous bursa.

The author describes the three types of chronic bursitis: the serous, the proliferating and the hæmorrhagic. Both of his cases were of the hæmorrhagic type. The histologic examination shows that in the majority of cases the primary lesion of the bursa is a hæmorrhagic pachybursitis. As in similar conditions of the vagina and testicle, the hæmorrhage is due to the fragility of the capillaries of the granulation tissue.

The differential diagnosis of a hygroma is sometimes extremely difficult as in the second of the author's cases. The hygroma, however, always develops very slowly and does not disturb the general health; it is only very late in the ulcerative period that its growth becomes irregular. After ulceration its growth ceases. A neoplasm, on the other hand, increases in size more constantly and rapidly and the patient's general appearance suf-

Salaghi, M.: **Sprengel's Deformity Congenital**

chir., 521.

Salaghi's case was that of a girl 8 years of age. The ribs showed malformations, especially on the right side and in the spine there was a slight cunei-

from the fourth to the seventh dorsal vertebra there were two corresponding compensatory curves toward the right. An embedding of the spinous processes due to the primary convex curve toward the left gave rise to lordosis of the segment The scoliosis was somewhat different from the acquired type in which the lateral deviation is usually not associated with such a notable degree of reclination

malformation of the vertebræ the deviation being due rather to the continuous action of pressure and traction The author considered the costal malformations as primary and the spinal deviation as secondary The right scapula was irregular as regards the spinal margin and showed a very wide supero-internal angle Although elevated and slightly rotated with regard to the inferior angle it could be lowered without difficulty as it was not held high by any fibrous cord binding it to the spine There was slight left lateral flexion of the head due probably to increased muscular tension This tension appeared clearly to be related to the right cervicodorsal compensatory curve and was the principal cause of the scapular elevation

A surgical operation is not indicated in this case The author intends to treat it by his method of manual reposition of the spine with which he has had many successful results in cases of adolescent scoliosis W A Brenman

FRACTURES AND DISLOCATIONS

Tinker M B Wound Excision and Early Reconstruction in the Treatment of Compound Fractures. *Ann. Surg* 1922 lxxv 38.

The author carried out experiments on wound ex-

thus prevent contamination of the clean excised area during excision

2 The relative value of various antiseptics in killing bacteria and in penetrating lacerated and contused tissue

3 The possibility of staining lacerated tissue so that it can be distinguished more clearly from the uninjured tissue

With regard to the first problem it was found that Harrington s solution was superior to all others and that formaldehyde solution and pure carbolic acid were of considerable value Potassium permanganate could not be relied upon in spite of its strong oxidizing value. Dichloramine T was also unsatisfactory

With regard to the second problem, frozen sections of excised tissue showed that the antiseptic penetrated deeply enough to care for practically all of the bacteria if the infection had not been in contact with the tissues too long to give it an opportunity to spread by the lymphatic or blood channels

With regard to the third problem it was found that strong solutions of acriflavine methylene blue and a hot saturated solution of permanganate of potassium stained the tissues sufficiently to aid in the dissection of the injured area, but the permanganate solution was the most satisfactory

The author urges the use of local anæsthesia in preference to general anæsthesia for wound excision and reconstruction surgery because it greatly reduces the risks it saves anæsthetic drugs and the services of the special anæsthetist and may be used in all cases in which the operative procedure is longer than one or possibly two hours

Immediate or early skin grafting is advised because it saves a great deal of time in healing Under local anæsthesia small deep grafts ½ in square or smaller are employed

A pedicled flap of skin should be used when nerve trunks tendons, or joints are exposed and when skin grafts do not offer sufficient protection If possible it should be turned from the immediate vicinity

Suppuration of the tendon sheaths associated with compound fractures of the hand or forearm results in serious disability while thorough wound excision or early effective disinfection often gives surprisingly good results. A tendon should be exposed either by an incision along the side or transversely in the line of the normal skin folds. Silk sutures give better results than catgut sutures Physiotherapy should be begun after one or two or at the latest three weeks. Tendon lengthening by various methods did not give as good results as direct suture even where it was necessary to hyperflex the involved joints in order to obtain apposition of the ends In cases of adherent tendons free fat transplants surrounding the separated tendons frequently give excellent results

Peripheral nerve injuries are common in connection with compound fractures Experience has shown that immediate nerve suture gives the best results even in cases in which the wound becomes infected Delayed nerve suture neurolysis and auto-transplants give fair results

Carrel Dakin treatment has proved to be of great value in clearing up infected compound fractures Therefore in wound excision the sacrifice of bone should be restricted to the minimum. Exposed bone should be covered with a skin flap as soon as possible Rudolph S Reiter, M D

Burian F The Treatment of Fracture of the Clavicle by Continuous Traction (Traitement par traction continue de la fracture de la clavicule) *Presse méd* Par 1922 xxx, 17

The treatment of fracture of the clavicle is difficult because of the difficulty of effecting immobilization Couteaud allows the arm to hang vertically

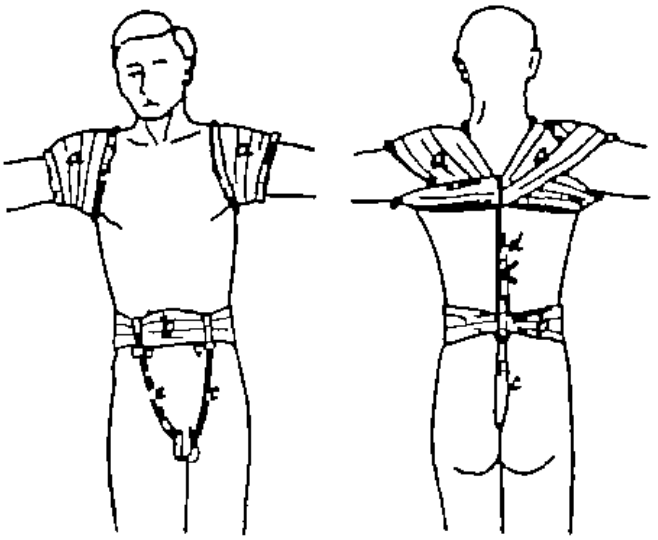


Fig. a, figure-of-8 bandage; b, belt; c, band.
Fig. 2. a, figure of 8 bandage; b, belt; c, band; d, rubber tube.

from the bed, a position which brings the clavicular fragments into contact, but the patient is very apt not to remain quiet long enough to permit consolidation of the fracture. Since the war, Burian has been convinced of the advantages of the ambulatory method of treating such fractures. To obtain continuous traction he uses Petit's figure-of-eight bandage.

With the patient seated on a stool the fracture is reduced under anesthesia and maintained by two assistants, one of whom, standing in front of the patient, keeps the arms in lateral extension and

th upp r and anterior parts of the shoulders. About IX turns are necessary. Muslin 14 cm. wide is used. A muslin bandage is also applied at the waist and held in place by strips passed between the thighs. A thick rubber drainage tube is then passed under the two bandages in the median line of the back, stretched, and tied. (See figure.)

The necessary degree of tension of the rubber is easily found. When the arms are slowly replaced in adduction the patient should experience only a firm elastic traction which pulls the shoulders backward. At the end of two hours the position of the shoulders is examined and the traction corrected if necessary. If cyanosis of the arm is noted the trac-

four weeks. At the end of that time the bandages may be removed and massage may be used.

W. A. Bardeen

Patel, M., and Badin, A.: A Study of Inward Luxations of the Elbow, Complete and Incomplete (Étude sur les luxations du coude en dedans, luxations pures et incomplètes). *Arch. franco-belges de chir.*, 1921, xxv, 62, 153.

The authors begin their comprehensive discussion of inward luxation of the elbow with a survey of the literature. Complete luxation of the elbow which is unassociated with fracture of the humerus or the bones of the forearm is rare. Inward luxation may be classed as incomplete since it is nearly always associated with a fracture. Only about sixty cases were collected from the literature and all of them antedated the use of the X-ray.

The authors report three cases of inward luxation with the complete roentgenological findings. In every instance the inward luxation was associated with a posterior luxation, that is, the posterior luxation was transformed into an inward luxation secondarily. These clinical findings corroborate the views of Denucé and Prignaud. In experiments on cadavers to confirm them it was found that the only procedure capable of effecting an inward luxation without fracture entailed a primary posterior luxation. The authors discuss the mechanism of the luxation theoretically.

The forearm is usually held in more or less marked flexion with some degree of pronation. The deformity is found on the inner side of the elbow and causes an increase of several millimeters in the transverse diameter. Palpation reveals that the three points of the dorsal surface of the elbow form an irregular triangle with the external side longer than the internal. The head of the radius cannot be felt.

If the condition is recognized and treated early the prognosis is generally favorable.

The treatment of recent inward luxation consists in transforming it into a posterior inward luxation by carrying the forearm into extension and then reducing the posterior inward luxation by rotation and traction upon the forearm. In old luxations no interference is attempted if the existing function is compatible with active movement. When function is defective the presence of complete ankylosis dominates the indications for treatment.

Loyal E. Davis, M. D.

Lambotte, A.: The Operative Treatment of Congenital Luxation of the Hip (Sur le traitement opératoire de la luxation congénitale de la hanche). *Arch. franco-belges de chir.*, 1921, xxv, 244.

In Lambotte's opinion the operative reduction of congenital luxation of the hip should not be abandoned entirely. He has operated successfully on numerous patients between 15 and 47 years of age. The oldest had a very decided bilateral luxation.

The use of Doyen's or Lorenz' apparatus for reducing the head of the femur is traumatizing. Lambotte therefore employs a special lever tractor and guides the femoral head into the acetabulum with a large spatula which is used like a shoehorn

An angular antero-external incision is made from the iliac spine to the base of the great trochanter and then down toward the thigh The muscles are separated and the thick capsule over the femoral head and neck is incised The spatula is then passed into the acetabulum the ligamentous attachments are widely incised and the acetabulum is hollowed out with Doyen tubular instruments unless it is very large when curettes the size of the femoral head sharp on one side and blunt on the other are used The femoral head is then trimmed and corrected as necessary and the reduction effected with the aid of the lever and spatula The traction necessary varies from 80 to 100 kgm Neither preparatory continuous traction nor tenotomy has ever been necessary The operation is as easy in the adult as in the child, and re-luxation after operation is very rare

The technique is that which Lorenz formerly described the only modification being the use of the tractor and reducing lever In 1909 Lambotte showed before the Belgian Surgical Society a woman 26 years of age who was cured of congenital luxation of the hip by the method described

W A. Brennan

Ashhurst A. P C and Bromer R. S.: The Classification and Mechanism of Fractures of the Leg Bones Involving the Ankle, Based on a Study of Three Hundred Cases from the Episcopal Hospital *Arch. Surg* 1922 iv 51

In spite of all the classical writings of Pott Dupuytren, and others, there is no entirely satisfactory classification of ankle fractures. Pott described a fracture which does not exist and Dupuytren commended him for his acute observation A transverse fracture of the fibula 3 in from the lower end as described by Pott is not found in any series of roentgenograms or postmortem specimens. Quénu states that the French mean by 'Dupuytren's fracture' exactly what the English mean by Pott's fracture It is probable that this fracture is the common one first described accurately by Maisonneuve

After a detailed description of the normal ankle joint the authors proceed to a discussion of the mechanism of fractures involving this joint and a classification based on 300 cases. In the production of fractures of the ankle rotation of the foot around the long axis of the leg plays an important part Inward rotation is almost inseparable from a movement of adduction and the foot is quite mobile in *this direction In outward rotation however the* foot acts as a rigid lever In relation to the tibia this is a lever of the first class with the fulcrum at the anterior border of the fibula, the power arm being the anterior four fifths and the weight arm the posterior one-fifth of the distance from the posterior border of the ankle to the toes. With relation to the fibula however it is a lever of the second class with the fulcrum at the posterior border of the inner malleolus and the power arm the entire distance from the posterior ankle border to the toes The longer power arm exerts more force against the external malleolus than the shorter power arm exerts against the internal malleolus. The lower end of the fibula is thus fractured by a force which pries the malleoli apart Of all fractures at the ankle this oblique one of the lower end of the fibula is the most frequent (25 per cent) If the rotation goes far enough the tip of the internal malleolus is broken off In the authors series of 300 cases this type of rotation fracture, including all its complications and variations occurred 100 times. In four cases the force against the internal malleolus was great enough to fracture the entire lower end of the tibia

Forced abduction produces in most cases an isolated fracture of the internal malleolus In the authors series 6 5 per cent were of this type If the bending A bending fracture occurs only when the tibiofibular ligaments have ruptured one end of the bone must be free and the other end fixed In thirty cases of fracture of the surgical neck of the fibula the lesion showed the characteristics of fracture by bending in twenty-eight and if it was not accompanied by rupture of the tibiofibular ligaments there was a history of direct violence or clinical evidence of severe sprain of these ligaments

Not infrequently the posterior marginal fragment of the tibia is a distinct clinical entity It was described by Cooper in 1820 but in 1915 Cotton described it as a 'new type of ankle fracture' and by some writers it is referred to as 'Cotton's fracture' The fragment varies from a small portion of the posterior lip to a large piece extending 10 cm up the shaft and there may be posterior displacement of the foot The mechanism which produces it is a crushing force from below upward This type of fracture occurred in fifty-eight of the 300 cases reviewed

The three abnormal movements of external rotation abduction and adduction are responsible for about 95 per cent of ankle fractures. It is impossible to classify these fractures anatomically because the variations in many instances are due only to variation in the force which produces them The authors therefore offer the following classification *based on the mechanism of the fracture*

		Per cent
A	Fractures by external rotation	
1	First degree lower end of fibula only (oblique)	26
2.	Second degree same, plus rupture of the internal lateral ligament or fracture of the internal malleolus	33
3	Third degree same, plus fracture of the lower end of the tibia	1 7
	Total	60 7

		Per cent
B.	Fracture by abduction	
	1 First degree internal malleolus only	6 6
	2 Second degree same, plus fracture of the	
		13 7
	3	
		0 66
	Total	21
C	Fractures by adduction	
	1 First degree external malleolus only	9
	2 Second degree same, plus the internal malleolus or the inner part of the tibial shaft	3 6
	3 Third degree same, plus the whole lower end of the tibia	0 66
	Total	13 3
D	Fractures by compression in the long axis of the leg	2 7
E	Fractures by direct violence	1 7

On the basis of a roentgen ray study of the ankle joint Bromer warns that in making a diagnosis of fracture of the posterior lip of the tibial articular surface one should remember that a supernumerary bone the os trigonum is sometimes present at this point With regard to the diagnosis of tibiofibular diastasis by the roentgen ray the authors state that if the space between the lateral margin of the fibula and the lateral border of the anterior tibial tubercle exceeds more than two-thirds of the width of the fibula it is most probable that there is diastasis of the first degree Emphasis is placed on standardized accurate technique in roentgenography Gross lesions are easily recognized by almost any method but to attain the finer points in diagnosis an exact method of technique is necessary

WILLIAM A CLARK, M D

Wakeley C. P G Malunited Abduction Fracture of the Ankle Joint Treated by Operation. *Arch Radiol & Electrotherapy* 1921 xxvi, 229

Lane and others have recently recommended operation as the best form of treatment for certain abduction fractures of the ankle joint

A malunited abduction fracture of the distal end of the tibia and fibula was operated upon by the author five months after the injury A transverse osteotomy of the fibula was performed through the line of fracture A wedge-shaped piece of bone was removed through a curved incision exposing the tibial malunion and the foot adducted To retain

massage and passive movements were begun After six weeks the patient was able to walk without a cane and skiagrams showed good anatomical alinement

Two and one-half years later the ankle movements were found to be full and free and there was no sign of flat foot or osteo-arthritis

DANIEL H LEVENTHAL, M D

SURGERY OF THE BONES, JOINTS, MUSCLES TENDONS, ETC.

Starr C L.: Army Experiences with Tendon Transference. *J Bone & Joint Surg.*, 1922, IV 3

In the recent war the attention of surgeons was directed to injuries of the extremities and the possibility of restoring function by muscle transference The problem presented was the redistribution of the active muscles to obtain balance and the restoration of the function of intact muscles.

Adherence to certain principles is necessary These the author presents on the basis of a personal experience of several hundred cases

1 As far as possible, muscles used to replace damaged muscles should have a similar action to the muscles they replace

2 If a portion of a tendon is to be transferred it must have the same action as the muscle it is to replace Half of the tendon of the extensor carpi radialis longior may be transferred to the long extensor of the thumb with good results. A hopeless result follows the transfer of half of the flexor carpi radialis to the extensor of the thumb.

3 The line of pull should be as straight as possible so that there may be no mechanical disadvantage

4 Fixation of the transferred muscle must be effected under tension This will take up the slack

5 All deformities due to tissue contraction must be overcome before tendon transference is attempted

6 The sheath of a muscle to be replaced may be used to receive the transferred tendon, but for the most part, transferred tendons should run in fatty subcutaneous tissue.

7 Tendons transferred in the lower extremity should be inserted into bone or periosteum. In the upper extremity attachment of tendon to tendon is adequate.

8 The recipient tendon should be split and the

factory suture material

9 The limb must be immobilized for three weeks Then a removable splint should be substituted This is removed for training

The training should be directed by an expert who has a thorough knowledge of anatomy and who has seen the operation. The best results have been obtained in the musculospiral nerve, probably because this nerve is for the most part a purely motor nerve and because the power necessary to overcome the disability is only that necessary to overcome gravity The object of the operation is to restore the extensor function of the thumb wrist and fingers The technique is as follows

The arm is prepared in the usual manner A 5 in incision is made on the palmar surface of the forearm, between the flexor carpi radialis and palmaris longus tendons, ending at the wrist The exposed tendons are freed from their sheaths to the middle of the forearm and divided at their insertion The skin edges are clipped together A 7 in. incision is then made on the dorsal surface of the forearm following a line from the external condyle of the humerus to the styloid of the radius The lower end of the incision is slightly hooked to expose the thumb extensors All bleeding must be con

the radius at the upper end of the incision The insertion of the pronator radii teres into the outer surface of the radius is thus exposed This tendon and the periosteum are freed from the radius with a periosteal elevator

The extensores carpi radialis longior and brevior are slit and the freed end of the pronator teres is threaded through from the deep surface and its perlosteal end sutured to the aponeurotic surface of these muscles. The tag ends are buried with a Lembert suture. The tendons of the common extensor to the fingers are freed from their sheath above the annular ligament and the separate sheath of the extensor minimi digiti is opened to expose all four tendons The three extensors of the thumb are exposed at the lower end of the radius. The long extensor of the thumb is lifted from its bed and brought alongside the extensor ossis metacarpi and the primary extensor of the thumb The flexors are then brought through a tunnel made through the subcutaneous tissue between the upper end of the palmar incision and the lower end of the dorsal incision. The three exposed thumb extensors are split and the palmaris longus, freed of its sheath and all areolar tissue, is threaded through all three and stitched to each with sufficient tension to keep the thumb extended

The four common extensors are similarly slit and the prepared flexor carpi radialis is threaded through. The end of the transferred tendon may be buried in the extensor minimi digiti or turned back on itself and stitched to each tendon and then to itself The fingers and wrist must be kept in hyperextension during this procedure The fascia is not sutured but an attempt is made to cover the exposed surfaces of the tendons with fat by bringing the skin edges together with a subcutaneous suture. A plaster-of Paris splint is put on for three weeks.

Tendon transference was done for various disabilities in about 300 cases. In fifty two cases re-examined after a period of from three months to two and three-fourths years the results were found to be excellent in twenty nine cases, good in fifteen fair in seven and poor in one.

JOHN MITCHELL, M.D

Kuhlma T: Pathologico-Anatomical Examination of Ankylosed Joints Mobilized by Operation (Pathologisch-anatomische Untersuchungen an operativ mobilisierten ankylotischen Gelenken) *Beitr z klin Chir* 1921 cxxiv 143

The author made pathologico-anatomical examinations of eighteen specimens from operations per formed by Payr for the mobilization of joints With the exception of one case of multiple arthritis deformans the ankyloses were due to war injuries, suppuration by extension, or metastatic gonorrhœal or other infections The material included fourteen knee joints three hip joints, and one elbow joint The time that had elapsed between the disease which caused the ankylosis and the mobilizing operation varied from eight months to fourteen years

Macroscopically the ankylosed joint and its vicinity showed more or less cicatrization In most cases the ankylosis was so firm that either no movement or only slight elastic passive movement was possible The connection between the surfaces of the joint was cartilage cartilaginous bone, or true bone The parts of the cartilaginous surfaces not directly involved were less altered but the cartilaginous tissue within the area of ankylosis showed very great alteration in the form of so-called asbestos cartilage i.e the cartilaginous layer uniting the opposing surfaces which in the operation were torn apart displayed an uneven, jagged surface of whitish somewhat translucent appearance. In two cases there was a marked production of osteophytes inside and near the cartilaginous connective tissue wall which bounded the asbestos-like ankylosed surfaces posteriorly Inflammatory processes were never found in the bone tissue of the extremities of the joint While the ligamentous apparatus showed the least alterations macroscopically the capsular ligament and the peri-articular tissues were markedly changed The capsule was solid and firm in some parts it was 1½ cm thick and streaked with adipose tissue

reparations
mc specimens
wa parts of the
joint ends Regardless of the etiology of the various ankyloses the picture was uniform The strongest organization and substitution processes were formed within the region of the ankylosis itself while the surfaces not involved in the ankylosis showed alterations only in spots.

The substitution of cartilaginous tissue which in general was *greatly degenerated proceeds from the* articular surface by granulation tissue rich in cells and from the bone marrow According to the variety of the substitution of the cartilage the ankylosis was fibrous, fibro-osseous or purely osseous The production of osteophytes so far as it consisted of purely marginal osteophytes is traced back to periosteal formation. The author attributes the periosteal inflammatory process to the primary trauma or to periosteal splintering due to the inflamma

tion Intra-articular new bone formation of which the end result is osseous ankylosis, results from bone formation by bone marrow elements which have penetrated the cartilage

In two cases the intra-articular production of osteophytes was traced back to the fact that the osteophyte was primarily a free traumatic loose body of the joint In the inner ligamentous apparatus of the knee joint the alteration was least, with

mobilization of ankylosed joints Hoskin (Z)

XXV 247

Some persons affected with infantile paralysis can keep their equilibrium and even walk without the aid of apparatus Others are unable to use the limb. The difference is due to the fact that in the first type of case the center of gravity can be made to fall in front of the knee by inclining the thorax, while in the second this is impossible because of involvement of the lumbar and buttock muscles

The surgical problem in such cases is to make the center of gravity fall in front of the axis of the knee when the body is not bent forward Lorenz was the first to devise an operation to throw the axis of the knee backward. By a supracondylar femoral osteotomy he placed the leg in genu recurvatum. This was done by Van Neck in four cases after necessary tenotomies and correction of the foot. Two of the patients are now able to walk without any apparatus, one walks well with the aid of a cane, and one is able to walk with an orthopedic shoe.

W A. Bardeen

Piero, G Tibio-Astragalar Disarticulation with an Anterior Hypocinematic Strip (Disarticolazione tibio astragalica a lembo anteriore ipocinematico) *Chir d organ d movimento* 1921 550.

Disarticulation of the foot is not often done because frequently the tibio-astragalar articulation is invaded or because when the soft parts are not in good condition, the surgeon prefers supramalleolar amputation which favors the formation of the classical posterior internal, or postero-internal cinematic strips.

Disarticulation of the foot is preferable to supramalleolar amputation because it gives a longer

give good results even when only the soft parts on the dorsum of the foot are preserved as in such cases the stump may be covered with a single anterior strip or a smaller anterior strip and two postero-lateral strips. Cases of extensive freezing, ischemic gangrene or subtotal traumatic destruction of the foot, which heretofore have been considered by the majority of surgeons as typical cases for supramalleolar amputation, are quite suitable for disarticulation.

When there is an indication for disarticulation of the foot and it is feasible to cut a posterior strip (the strip of choice), it is advisable to make the disarticulation with the Syme incision and to create

beyond Lisfranc's tarsometatarsal interline (2) dissection of this strip for about 2 cm from the underlying soft parts, incision of the soft parts to the bone, and elevation of the strip with the dorsal

strip over the articular surfaces and suturing of the anterior to the posterior tendons (7) suture of the skin and plastic repair

Good results were obtained by the author in three cases. W A Bardeen

Schr

On a pathologico-anatomical basis the author classifies flat foot into the following varieties

1 The muscular form The tension of the arch

condition is curable at first, but later after contraction and stretching of the ligaments, becomes permanent.

2 The ligamentous form an advanced stage of the muscular form.

3 The osseous form with bending of the longitudinal axis of the foot, a form developing from the ligamentous form. The entire foot is flat, the talus and calcaneus are rotated around the longitudinal axis, the anterior portion of the foot is in abduction, pronation and supination are suspended, and the

and third forms are to be treated by compression

and reduction The anterior part of the foot must be placed at the correct angle with the posterior part. The author describes the technique The position of the toes must be corrected in plaster of Paris. A foot plate should never be used

GRAHEY (Z)

Mayer L. The Treatment of Paralytic Flat Feet *J Bone & Joint Surg* 1922 iv 39.

The author classifies paralytic flat feet on the basis of the muscles weakened and the extent of the paralysis as follows

TYPE 1 This group comprises cases of isolated paralysis of the tibial anticus. Inversion is impossible when the foot is dorsiflexed but possible when it is below a right angle. To be sure that complete paralysis has occurred it is necessary to immobilize the foot in calcaneovarus thus bringing the origin and insertion as near together as possible If the Achilles tendon is shortened it should be divided Immobilization should be maintained for six weeks If by this time there is no return of function complete paralysis may be assumed If there is the least sign of function the immobilization should be continued but exercise and massage should be given Plaster should be used for the first six weeks and then a brace.

TYPE 2 This group includes those of the first type in which the anterior tibial is completely paralyzed and those in which there is partial paralysis of the anterior tibial with some weakness of other inverting muscles. Operation is necessary

The author s study of muscle balance has shown that the tibialis anticus acts as a strong inverter when the foot is below an angle of 90 degrees. On further dorsiflexion it acquires a slight abducting power When the action of the Achilles and anterior tibial were combined, marked inversion of the dorsiflexion resulted.

The rule followed by Mayer is that the inverters should slightly outbalance the everters

Tendon transplantation is resorted to in the second type of cases. In those which are mild the extensor proprius hallucis is used and in those more severe, the peroneus longus

The insertion of the paralyzed anterior tibial tendon is exposed and then the upper end of the tibial sheath A threaded probe is passed down through the sheath until it emerges at the insertion of the tendon. The tendon to be transplanted is then exposed and drawn downward through the sheath of the anterior tibial by means of the guide suture Since adhesions will occur when the tendon crosses the anterior intermuscular septum a fascial plastic is employed when the peroneus longus is transplanted In this plastic operation a trapdoor flap is cut in the fascia of each muscular compartment the fascia is everted the two fascial edges are united by means of a Lembert suture and the transplanted tendon is attached to the bone at the insertion of the tibialis anticus Within sixteen days there is physiological fixation of the tendon and

which there except the

Achilles. The treatment still remains unsatisfactory In one case the author transplanted the ex [illegible] foot xtensor to the

peroneus longus These results were not so satisfactory

TYPE 4 In cases belonging to this group there is complete paralysis of all inverters including the Achilles tendon The type is rare Of the methods of treatment the author prefers bone stabilization.

The after treatment of all cases demands the use of suitable appliances until the weakened muscles have regained their maximum strength Post operative muscle training must be employed A night splint of plaster or celluloid should be applied

JOHN MITCHELL, M D

SURGERY OF THE SPINAL COLUMN AND CORD

Jacobaeus H C. On Insufflation of Air into the Spinal Canal for Diagnostic Purposes in Cases of Tumors in the Spinal Cord. *Acta med Scand.*, 1921 lv 555

Insufflation of air into the spinal canal to replace the fluid removed in cases of tuberculous meningitis was first used in 1909 but was without benefit

Jacobaeus first insufflated air for diagnostic purposes in a case of spinal cord tumor in July 1919 He has since used the procedure in three other cases with positive results and in a few with negative results. There was no difficulty in showing the air column but it was very difficult to obtain an easily visible upper limit After the withdrawal of 20 to 30 c cm of cerebrospinal fluid a corresponding quantity of air or oxygen-gas was injected with an ordinary 20-c cm Record syringe In the cases in which a tumor was found the pain was very slight In those in which no tumor was found a severe headache persisted for several days.

The first case was that of a man 43 years of age from whom an extradural neuroma opposite the eighth dorsal vertebra was removed. Three months after the operation his general condition was slightly improved but the spasticity and limitation of motion in the legs remained unchanged

The second case was that of a man 53 years of age from whom an intradural neuroma opposite the ninth thoracic vertebra was removed Two months later he was discharge from the hospital much improved from the standpoint of mobility but the sensory disturbances were only slightly improved.

The third case was that of a man 40 years of age from whom a fibrosarcoma of the dura mater involving the arches at the fourth and fifth dorsal vertebræ was partially removed The patient was discharged from the hospital about ten weeks later not much improved Six months later he was considerably improved and could walk quite a long distance without becoming tired

In Cases 2 and 3 the upper limit of the air column corresponded well to the lower limit of the tumor as found at operation In the third case the air column stopped somewhat below the lower limit of the tumor It is not known whether this was due to adhesions or a too-small quantity of insufflated air The results already obtained, however indicate that this method may be of definite value in the topical diagnosis of spinal tumors While errors may be made when for some unknown reason the air does not extend quite up to the tumor distinctness of the air column indicates the absence of a spinal cord tumor CARL R STEWART, M D

Thorburn, W : The Diagnosis and Treatment of Intrathecal Tumors of the Spinal Cord. *Brit M J.*, 1912, 1, 49.

In a very interesting article the author lays stress upon the fact that in the treatment of intrathecal tumors of the spinal cord we have one of the most

injury

2 Tuberculous disease of the spine This may be differentiated by radiological studies Attention is drawn here to the fact that local tenderness revealed by tapping the spinal processes and even local kyphosis may be present in cases of intrathecal growths

3 Malignant growths in the vertebræ themselves These however are usually secondary and the finding of a primary growth elsewhere leads to the correct diagnosis

4 Syphilis This may be excluded by the usual methods

5 Growths, tuberculous masses and cysts

In cases of intrathecal tumors of the spinal cord pain as an early symptom is of importance This may or may not be associated with paræsthesia with a certain degree of anæsthesia The pain may be explained by the clinician as rheumatic or of visceral origin but more careful study leads to the correct diagnosis

The diagnosis having been made, it is important to localise and remove the growth Localisation demands (1) careful examination to ascertain the highest level of sensory or motor phenomena, (2) a knowledge of the distribution of the spinal segments (3) recognition of the relation of these segments to the spinal processes and (4) correct

Pathologic reports of growths removed vary greatly though probably they all arise from the

fact that exploration does no harm even if the diagnosis is incorrect (3) the possibility of arresting many cases of transverse myelitis by incision and

attacked

Cyriax, E. F : Partial Spondylolisthesis or Minor Displacement Forward of the Fifth Lumbar Vertebra. *Med Press* 1911 n.s. xcii 10.

thirty two were those of females and twenty five of the latter had not had children. There was a history of anæmia in twenty of rickets in six of infantile paralysis in two and of some other para

In three cases
In fourteen
in five cases,

The symptoms depend upon the degree of compensation for the changes. Persistent backache develops in the area of displacement and is markedly increased when pressure is applied over the fifth lumbar vertebra in a direction which increases the

author has never observed symptoms pointing to pressure on the spinal nerves

The treatment is the same as for displacements elsewhere namely reposition with after treatment by mechanotherapeutics to strengthen the affected articulations The longest treatment given by the author consisted of twenty manipulations for reposition, and the shortest of two In no case did the deformity recur Gynecological and rectal conditions must also be taken into consideration

F W CARPENTER, M D

Bachlechner K Operative Ankylosis of the Spine in Tuberculous Spondylitis (Zur operativen *Versteifung der Wirbelsaeule bei tuberkuloeser* Spondylitis) *Beitr z klin Chir* 1921 cxvii 655

In answering the question whether in tuberculosis of the spine, ankylosis should be effected by bone bridging the cases of importance are those in which the end result of the bone implantation can be seen at autopsy Up to the present time two cases have been reported by Meyer from the Biesalski Clinic and one case has been reported by Goerres in which examination showed an absolutely firm bony union between the inlay and the spinous processes

The author reports the case of a patient who died eight weeks after the operation At autopsy the part of the implant not covered with periosteum was found to be fused with the spinous processes but its periosteal side was not fused even at its free border though it was impossible to loosen the implant from the spinous processes.

Bachlechner states that in certain movements of the spine flexion forward and backward, the implant becomes very firmly united with the vertebræ but a rotary flexion at the lower portion may easily cause its fracture It is evident therefore, that rotary movements must be prevented.

VORSCHUETZ (Z)

Gobbi L.: A Case of Lumbosacral Bone Tumor (Un caso di tumore dello scheletro lombosacrale) *Arch ital di chir* 1921 iv 519.

The patient whose case is reported was a girl who came to the hospital with a diagnosis of Pott s disease of the fourth and sacralization of the fifth lumbar vertebra. About a year previously she had fallen on the sacral region Some months later pain was experienced in the right malleolar region and knee and finally became localized and intensified in the lumbosacral region where a large fluctuant lump could be felt. Hæmorrhagic fluid was withdrawn several times by exploratory puncture. As puncture was insufficient to relieve the tension, an incision was made over the tumor A large quantity of grumous bloody fluid escaped. Deep exploration of the focus revealed involvement of the sacro-iliac articulation. Following this operation the patient s condition improved and she left the hospital. At a subsequent examination her general condition was found the same as before but locally a neoformed tissue beneath the skin and evidently of deep origin was discovered This constantly increased in size. Sections were removed for histologic examination. The patient ultimately died of bronchitis and nephritis

In this case, despite the almost total destruction of the sacrum, there were practically none of the vertebral osseous symptoms usually associated with spinal tumors The radicular symptoms were almost entirely sensory disturbances until very late when there were bilateral sciatic pains and nearly complete anæsthesia of the soles of the feet. Medullary symptoms were almost entirely lacking

The principal objective signs were anæmia progressive emaciation and cachexia Finally there was reason to suspect an intestinal metastasis of the neoplasm in the form of a hard palpable nodule in the hepatic flexure of the colon There were then painful attacks of colic accompanied by diarrhœa

As there was no autopsy histologic examination was limited to biopsy The neoplastic tissue showed fibrosarcoma with cartilaginous islets in various stages of development Two types of connective tissue cells were demonstrable fusiform cells of connective tissue and cartilage cells. Hence the structure was that of a fusocellular chondrosarcoma

The author gives a number of histologic illustrations and reviews the history of this type of neoplasm

W A BRENNAN

Lupo M : Vicious Sacralization of the Fifth Lumbar Vertebra, with Special Regard to Its Morphology in Infancy (Contributo alla conoscenza del vizio di assimilazione sacrale del 5 metamero lombare con speciale riguardo alla sua morfologia nell infanzia) *Chir d organi di movimento* 1921 v 503

Lupo complains that in France there is a tendency to ignore the work previously done by Italian investigators with regard to the anomalies of the lumbar vertebræ, especially the work done by Putti, Serra Bertolotti, Rossi and Coleschi Although in 1910 and 1912 Adams and Goldthwait in America resected the right transverse process in a case of sacralization of the fifth lumbar vertebra with sacro-iliac pain, it was Bertolotti who in 1917 first described a clinical syndrome of vicious regional differentiation and classified ischiatic, lumbar sciatic, ureteral and other typical pains according to their origin.

The relationship of clinical symptoms and skeletal anomalies has shown that from the second decade of life sacralization of the fifth lumbar vertebra may set up a painful syndrome of a character which varies with the morphology of the anomaly It is incorrect to speak of a painful syndrome in regard to the phenomenon in infancy as it is well known that the subjective and objective syndrome is not established until the complete development of the bone. In Lupo s opinion however it would be of interest to make a careful search for any such malformations during the period of early extra uterine development in order to confirm the beginning of the clinical syndrome and discover what conditions result from or are associated with regional heteromorphism

The author reports eleven clinical cases of sacralization of the fifth lumbar vertebra in children under 16 years of age who had scoliosis coxa vara or some other deformity in addition. From these cases he draws the following conclusions

1 Sacralization of the fifth lumbar vertebra is not more rare in infancy than in adult life.

2 The defect is more frequently bilateral than unilateral.

The third case was that of a man 40 years of age from whom a fibrosarcoma of the dura mater involving the arches at the fourth and fifth dorsal vertebræ was *partially removed*. *The patient was discharged* from the hospital about ten weeks later not much improved. Six months later he was considerably improved and could walk quite a long distance without becoming tired.

In Cases 2 and 3 the upper limit of the air column corresponded well to the lower limit of the tumor as found at operation. In the third case the air column stopped somewhat below the lower limit of the tumor. It is not known whether this was due to adhesions or a too-small quantity of insufflated air. The results already obtained, however, indicate that this method may be of definite value in the topical diagnosis of spinal tumors. While errors may be made when for some unknown reason the air does not extend quite up to the tumor, distinctness of the air column indicates the absence of a spinal cord tumor. CARL R. SNEDDEN, M.D.

Thorburn, W.: The Diagnosis and Treatment of Intrathecal Tumors of the Spinal Cord. *Brit. M. J.* 1922, i, 49.

In a very interesting article the author lays stress upon the fact that in the treatment of intrathecal tumors of the spinal cord we have one of the most

Pathologic reports of growths removed vary greatly, though probably they all arise from the dura, pia, or arachnoid.

From the less typical case history the author draws attention to (1) the importance of exploring doubtful cases of transverse lesions of the cord, (2) the fact that exploration does no harm even if the diagnosis is incorrect, (3) the possibility of arresting many cases of transverse myelitis by incision and drainage of the dura mater if, as he holds, such myelitis is often due to infection spreading along the nerves and then necessarily crossing the meninges and intradural space before the cord itself is attacked.

In Thorburn's opinion the infections are usually derived from the urinary organs. This theory agrees with the tendency of transverse myelitis to attack

Cyriax, E. F.: Partial Spondylolisthesis or Minor Displacement Forward of the Fifth Lumbar Vertebra. *Med. Press*, 1922, n.s. cxiii, 10.

resolve itself into the [illegible] lavistic regression. That [illegible] nected with a pathologic cause is today admitted almost universally, but thus cause has not yet been determined. W. A. BRENNAN.

Peabody, C. W.: Secondary Foci of Tuberculosis in the Spine in Pott's Disease. *Ann. Surg.*, 1922, lxxv, 95.

Within a period of six months there came under the author's observation in one clinic four cases of secondary foci in Pott's disease. As this frequent [illegible] therefore a routine search for [illegible] lesions would probably show a higher incidence of secondary foci.

Peabody speculates as to the manner in which the process spreads—whether the lesions are separate hematogenous infections from a common distant source, whether the second lesion is caused by organisms thrown into the blood stream by the first lesion and whether the new focus is a direct metastasis through the lymphatics. He believes there is evidence in favor of the third theory.

JOHN W. POWERS, M.D.

SURGERY OF THE NERVOUS SYSTEM

Heil: [illegible]

According to Stoffel, the exact apposition of individual nerve strands is generally impossible and

tory processes arising in remote wounds is more frequent than has been believed heretofore.

The author has entirely abandoned internal neurolysis as it yields a very small percentage of cures (12 per cent). As far as possible the sutured nerve must be placed in healthy surroundings. Isolation by means of calf arteries protects the nerve for a certain time only and wrapping in fascia gives utterly bad results. Rubber drains give the best protection to the site of suture as they have been found still unattacked by granulations after five years.

The author's technique is now much more simple than at the beginning of the war Instead of small incisions, specific adaptation, internal neurolysis and atypical partial resection he now prefers large incisions, careful handling of the nerves and a simple transverse resection. The end results however are not much better Of 300 cases operated on, eighty-seven reported in 1917 immediately after the operation were subsequently re-examined In a fourth of these cases there had been no improvement after thirty months in three fourths there was improvement and in one fourth of the latter a complete cure Of the cases of diastasis only one was cured a case in which a defect of the sciatic nerve at the level of the gluteal fold 8 cm long was entirely healed within two years after the gap had been bridged with silk threads Therefore the author has become convinced of the value of tendon transplantation in such cases

The most favorable results from operation were shown by the radial nerve the worst by the plexus In mixed nerves the restoration of the motor strands always took place earlier than that of the sensory It was often impossible to overcome the irritation of sensory nerves, attributed by the author to neuritis even by section of the nerve Hence in one case of sciatica he resected the fifth lumbar and the first three sacral roots and in another case the second and third sacral roots. The results were very satisfactory KEMPF (Z)

Lahey F H and Clute, H M: Spinal Accessory Paralysis Following Neck Dissection. *Boston M & S J* 1922 clxxxvi, 1

Letters were sent to 132 patients who had had a dissection of the neck for tuberculous lymph nodes at the Boston City Hospital Of forty-six who replied twelve had paralysis of the spinal accessory nerves The loss of function was most marked by inability to abduct the arm beyond a right angle with any degree of power or to elevate the shoulders

The relations of the spinal accessory nerve and the formation of the subtrapezius plexus are shown in three dissection plates Photographs of seven patients are given

In the authors opinion the spinal accessory nerve is probably quite susceptible to the effects of trauma and its regenerative capacity following trauma is limited particularly when the regenerating must occur while the nerve is still located in a field that is to be the site of considerable scar tissue

For the identification of the nerve a battery with electrodes should be used the nerve should never be pinched

In conclusion the authors state that in undertaking neck operations for lesions not necessarily fatal the loss of function secondary to spinal accessory paralysis must always be considered of serious consequence This complication is not always avoidable because it is sometimes practically impossible to preserve the nerve and remove the disease foci and because interruption in conductivity may follow even when the nerve has been preserved

To undertake neck dissections of the type under discussion the surgeon should familiarize himself thoroughly with the course and relation of the spinal accessory nerve and the second third fourth and fifth cervical nerves and should take great care to preserve them CARL R. STEINER M D

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Renaud A.: A Case of Primary Multiple Carcinomata (Un cas de carcinomes multiples primaires) *Rev méd de la Suisse Rom.* 1921 xli 773

The author reports the case of a patient 77 years of age who had a lesion in the skin over the left frontoparietal area which was clinically diagnosed as a rodent ulcer Over the right temporal region was a vegetative growth The ulcerated lesion had developed gradually during a period of five or six years while the other lesion had appeared in three or four months, directly following the application of bichloride of mercury paste to an area of senile keratosis. Histologically the rodent ulcer showed a typical squamous-celled carcinoma with epithelial pearls, while the vegetative lesion showed a basal celled carcinoma

The fundamental histologic and clinical differences in these two lesions occurring in the same individual present a rare picture which cannot be explained satisfactorily by any of the known theories regarding the development of carcinoma LOYAL F DAVIS M.D

Kuijper J H The Surgical Treatment of Tumors (Die operative Behandlung der Geschwulste) *Nederl Tijdschr v Geneesk* 1921 lxv 2466

The question whether a cancer should be treated by operation or by radiotherapy must be answered on the basis of its variety and location Carcinomata of the skin lips, vulva, or penis can be cured by operation or by radiotherapy For carcinoma of the eyelid, ala nasi, or eyebrow radiotherapy is to be preferred to operation. Inoperable tumors are best treated by radiotherapy Metastatic lymph glands should be removed surgically Rapidly growing carcinomata of the skin and mucous membrane should be treated by enucleation followed by radiotherapy

Carcinoma of the tongue, the stomach and the intestine demand radical removal. In cases of carcinoma of the rectum gall bladder, pancreas, uterus,

and breast removal and radiotherapy are indicated Carcinoma of the breast with necrosing and infiltrating growth should be treated by enucleation followed by radiotherapy if there are multiple neoplasms, radiotherapy exclusively is indicated Sarcomata are in general more difficult to operate upon than carcinomata and hence are treated preferably with the X-rays and radium the same may be said of lymphogranulomata The prognosis of melanosarcoma is unfavorable in all cases Duncan (Z)

Robinson, C. A.: Notes on Twenty Cases of Ulcer of the Leg Treated by Electrical Methods. *Arch Radiol & Electrotherapy* 1922 xxvi, 253

The ulcers in the cases reviewed were what would be called varicose ulcers without the presence of varicose veins In many of the cases scarring had deprived the ulcer of a proper vascular supply The first indication in such cases are measures to increase the blood flow through the tissues by relieving the stasis and rendering the scar tissue more vascular In the cases reported the direct current was used

or contracted, diapedesis is modified, the amœboid movements of leucocytes are hastened and phagocytosis is increased

In applying the current the legs were placed in Schnee cells connected with a direct current supply the leg with the ulcer being placed in the cell attached to the negative pole A current of *30 milliamperes was employed for thirty minutes* A large part of the current passes through the ulcer because of its lessened resistance but a sufficient amount traverses the skin to cause a general hyperæmia

Of the twenty cases, four were definitely cured within two to eight weeks Five are healing rapidly or were doing so when they were transferred to other institutions In four cases the treatment failed. In the remainder the results were inconclusive as some had been under treatment only a few days one developed an epithelioma necessitating amputation, and one patient was syphilitic If only cures and failures are considered 50 per cent were cured All the cases were chronic and had been under other treatment for years.

O S Proctor, M D

BLOOD

Bull, P: What Can More than 6,000 Postmortem Examinations Teach Us About Emboli and Embolic Gangrene of the Extremities? *Acta chirurg Scand* 1922 lv 315

Emboli may come from (1) a more or less central spot in the arterial system, especially the aorta, (2) the left side of the heart, (3) the pulmonary veins, (4) the right side of the heart and (5) the systemic veins The two last possibilities, however presuppose a patent foramen ovale through which

fifteen times. As regards the localization of the emboli and gangrene these fifteen cases may be grouped as follows

Artery	Cases	With gangrene	Without gangrene	Doubtful
Aorta	2	1	1	
Common and external iliac	6	1	4	1
External iliac and femoral	1			
Hypogastric and deep femoral			1	
Superficial femoral			1	1
Femoral (?)	1	1		
Popliteal	1		1	
Subclavian and axillary	1	1		

The lower extremities were attacked in fourteen cases, the upper extremities in only one

In thirteen of the fifteen cases the formation of thrombi in one or more of the cardiac cavities was demonstrated In the two remaining cases the primary thrombosis was formed presumably in the aorta

Among 6 140 sections thrombosis of the aorta and heart was found in 243 cases, about 4 per cent of the total number

Thrombic deposits on the valves were demonstrated in seventy-three of 6 140 postmortem examinations, and almost exclusively in the left side of the

appear at the same time in both halves of the heart

Morris H Kahn, M D

BLOOD AND LYMPH VESSELS

Neff J M: Blood Vessel Suture *Surg Gynec & Obst* 1921 xxxiii, 657

The indications for blood vessel surgery are

1 A break in the continuity of a blood vessel due to an external cause such as a gunshot or stab wound or to an internal cause such as a fracture, dislocation, or traction exerted in an attempt to reduce a dislocation or straighten a limb that has been in the flexed position for a prolonged period of time

2 Resection of a vessel in a surgical operation such as the removal of a growth involving an artery

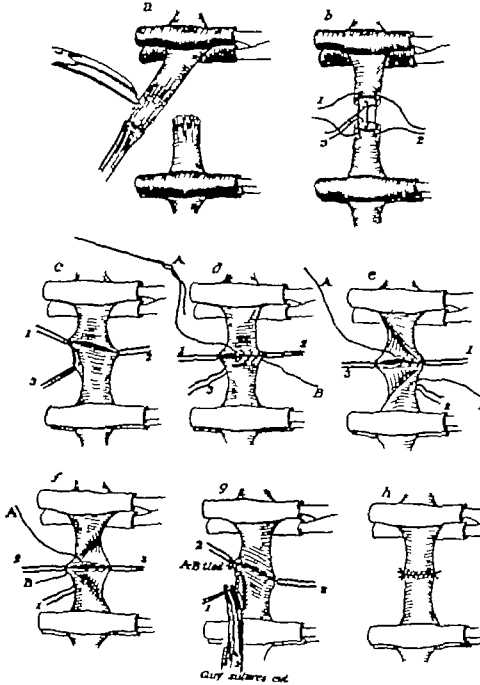


Fig. *A* The clamps are in place on the vessel and the adventitia is being drawn over the end of the vessel and about to be cut off by the scissors.

Fig. *B* The three guy rope sutures equidistant from each other are in place having been passed through all coats of the vessel. Guy ropes 1 2 and 3 on them and the

uniting the edges,

passing through all the coats

Fig. *E* Traction is now being made on Guy ropes 1 and 3 twisting the vessel through one-third of its circumference. The same continuous suture, *B* is shown passing through all coats of the vessel.

Fig *F* The continuous suture, *B* has passed Guy rope 3 traction is being made on 2 and 3 after 3 has been passed beneath the vessel. Traction on 2 and 3 now twists the vessel through another one-third of its circumference but in the opposite direction

Fig *G* The continuous suture around the vessel is now complete

Fig. *H* The guy ropes and continuous sutures have been cut and the end to-end anastomosis is complete

or vein or both or the accidental injury of a vessel during the course of an operation, as in the removal of enlarged glands or new growths from the neck axilla or groin The femoral artery and vein have frequently been injured during hernia operations, either by passing the needle through them or through the deep epigastric artery at its origin

asepsis, the absence of tension between the united segments of the artery or vein, and the avoidance of injury to the intima The exposed ends of the vessels must be kept moist with warm normal salt solution throughout the operation and care must be taken to prevent the adventitia from coming between the injured ends of the vessel.

The contra-indications to operation upon a blood vessel are (1) sepsis, (2) any considerable degree of tension between the ends of the vessel, (3) a poor general condition of the patient rendering him unable to stand the rather prolonged operation of vessel suture (4) irreparable injury of the vessel,

method is shown in the accompanying figures

FRANCISCO CRANFORTER, M D

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Schmieden, V., and Pelper, H Experiences with

9 cxvm, 845

The authors discuss the theory of Fischer according to which the common and most important symptom of the etiologically different diseases to which the term epilepsy is applied is an increased *predisposition to convulsions* The convulsive mechanism can be incited to action through various points of attack One point is the brain, and another the adrenal cortex Both are connected by the sympathetic nerves

On the basis of these facts, Bruening claims to have favorably influenced not only the genuine but also traumatic epilepsy by reduction of the adrenal tissue or the extirpation of one adrenal gland In traumatic epilepsy this operation is indicated only after failure of the cerebral operation

In the Frankfort clinic seven cases of epilepsy due to various causes (the genuine form epilepsy due to foetal encephalitis or cerebral infantile paralysis) and in patients of various ages (from 6 to 23 years) and of both sexes were treated by transperitoneal extirpation of the left adrenal gland. In the case due to cerebral infantile paralysis, that of a boy 14 years of age, a superficial cerebral cyst with thick connective tissue walls, cicatricial changes of the brain substance, and chronic oedema of the cerebral meninges was emptied in another clinic nine months before the extirpation of the adrenal gland. After these operations the authors observed a more or less distinct lessening or disappearance of the convulsions This continued for five days to five weeks, but the old condition then returned. In two cases, including the case with the cerebral and adrenal operation the convulsions became more severe in spite of the continuous administration of luminal Nevertheless the authors do not wish to draw from their failures conclusions against the operation or against Fischer's theory as they believe that a compensatory hypertrophy of the remaining adrenal gland is possible. The extirpated adrenals, however showed normal weight and no changes in the finer structure of the cortex which would suggest a disturbance of function.

The postoperative changes of other organs, particularly of the endocrine glands and the effects upon the female sexual glands are also discussed The authors observed once a transient amenorrhœa after the operation in a case in which previously menstruation had been regular and in another case a return of the menses after their absence for eight years. In a sexually precocious 16-year-old epileptic there was a distinct diminution of the libido but this lasted for only a few weeks The effect of practical importance exerted by extirpation of the adrenal gland upon the pancreas was a decrease in the blood sugar to half Marked differences in the blood pressure before and after the operation were not observed.

The blood picture showed a postoperative change in the sense of a percentage variation in the leucocytes (for example an increase of the polymorphonuclear neutrophiles from 9 000 to 40,000 and a

jective symptoms during the intervals between attacks and the attacks themselves had become less frequent and less severe KRAUS (Z)

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Cannon W B: Studies in Experimental Traumatic Shock. IV Evidence of a Toxic Factor in Wound Shock. *Arch Surg* 1922 iv 1

Wound shock is characterized by a low venous pressure a rapid thready pulse a decrease in the blood volume a normal or increased erythrocyte count and hæmoglobin percentage in the peripheral blood a leucocytosis an increase in the blood nitrogen a decrease in the blood alkali a lowered metabolism a subnormal temperature a cold skin which is moist with sweat a pallid grayish or

extremely minute amounts of histamin a substance derived from the amino-acid histidin by the removal of carbon dioxide causes changes resembling those of shock, the blood leaving the arteries and veins and being concentrated in capillary areas. The action of histamin typifies the action of the toxic substances derived from protein material—products of partial digestion of bacterial action and of tissue extraction.

Secondary shock is a traumatic toxæmia and not of the nature of a nervous effect It is characteristically observed in association with extensive damage of muscles or multiple wounds scattered over the body Whatever favors absorption at the region of injury is favorable to the development of shock and whatever delays or checks absorption from the injured region delays the development of sho
long
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the shock following burns but also the delayed shock following severe trauma is properly placed in the same category with other forms of general depression of bodily function and defective circulation due to the setting free of toxic material in the body

MORRIS H. KAHN M.D

Crile, G W: Studies in Exhaustion: III Emotion *Arch. Surg* 1922 iv 130

Intense emotion, especially fear is one of the most injurious of human experiences. The fear of hunted animals is similar in its effect

Experiments were carried on with rabbits which for varying periods of time were threatened by muzzled dogs. In some instances the frightened animals were killed at once in others varying periods of time were allowed to elapse before they were killed in order that the later effects of the emotion might be studied in still other cases the animals were subjected to daily periods of fright for several successive days.

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the hydrogen ion concentration of the blood and the basal metabolism

Extreme emotion caused demonstrable histologic lesions in the central nervous system the liver and the adrenals The brain cells showed increased activity manifested by hyperchromatism followed by a progressive chromatolysis In cats fear caused glycosuria albumin and casts in the urine a decrease in the metabolism (after the period of fear) changes in the iodine content of the thyroid and increased hydrogen ion concentration of the blood

Clinically extreme emotion raises the body temperature increases the respiratory and pulse rate and if sufficiently intense and prolonged produces complete prostration which may prove fatal

This research has shown that emotion drives the organism with extreme intensity that like trauma or exertion it may drive it within the limits of normal response or so overwhelmingly as to suspend the normal functions and reduce the individual to a state of complete cold prostration In other words emotion may cause exhaustion it may cause shock.

The paper is splendidly and instructively illustrated

MORRIS H KAHN M D

Lee, F C.: The Establishment of Collateral Circulation Following Ligation of the Thoracic Duct *Bull Johns Hopkins Hosp.*, 1922 xxxiii, 21

After reviewing the literature on the experimental ligation of the thoracic duct the author describes an intrathoracic method for the complete ligation of the duct in the cat. Apparently the integrity of the thoracic duct is not essential to the life of the animal

In some cases in which the ligation was absolute collateral lymph circulation was established to the right thoracic duct, while in other cases which showed complete ligation lymphaticovenous connections were found between the thoracic duct and the azygos vein.

These findings, which have a bearing also on fat absorption as well as on the clinical aspect of injuries to the thoracic duct, may be explained partly but not entirely by the embryology of the lymphatic system

SAMUEL KAHN M D

Baetzner W: Experimental Free Transplantation of Periosteum (Ueber experimentelle freie Periost verpflanzung) *Arch f klin Chir* 1921 cxviii 504.

In experiments on dogs an attempt was made to determine whether small fragments of periosteum completely separated from bones and periosteum and transplanted into the soft parts are capable of forming bone Periosteum removed from the anterior crest of the tibia was buried in a muscle belly The earliest removal occurred after four weeks and the latest after six months

In the first series of experiments in which fifty seven transplantations were done no bone was found

in a single case In a large majority of the cases, and especially in the cases of later removal, the periosteum had been entirely absorbed and the area of implantation was indicated only by very slight retraction or a fine whitish scar in the musculature

The second series of experiments on young dogs consisted of sixteen transplantations In six cases

bone suggested that it had been transplanted with the periosteum

In view of the findings in both of these series of experiments it seems evident that free transplants of small pieces of periosteum cannot form permanent bone in adult or adolescent dogs VALENTIN (Z)

Bryant, J Visceral Adhesions and Bands: Normal Incidence *Am J M S* 1922 clxiii, 75

The material on which this paper is based was obtained before the world war in the collection of the data of a much more comprehensive investigation regarding the etiology and treatment of chronic intestinal pathology It consisted of a series of over one thousand observations in 297 consecutive autopsies on bodies of all ages and both sexes, the only cases excluded being those few recently operated upon and those exhibiting recent frank peritonitis The adhesions or bands present showed a most interesting uniformity as regards percentage frequency in both sexes, not only in the foetus but also in the bodies of older persons The order of frequency of the seven most common adhesions is shown in a table as follows

ADHESIONS OR BANDS	Males Per cent	Females Per cent
Gall-bladder to the duodenum and the transverse colon	25 6	24 8
Gall bladder to the transverse colon	17 2	9 4
Gall bladder to the duodenum	15 5	7 9
Appendix to the peritoneum	15 0	5 9
Omentum to the ascending and the transverse colon	11 1	12 0
Ascending colon to the transverse colon	10 6	5 9
Duodenum to the peritoneum	6 7	10 3

A consideration of the adhesions from the standpoint of the individual organs involved at varying ages and in both sexes is reserved for a later publication

As a result of the study of these cases Bryant arrives at the following conclusions

1 The frequency of adhesions or bands in the

such variations from the normal

2 The adhesions present in the foetus are less varied in number and of a definitely less complex type than those found in later life.

3 The age of 40 is critical in both sexes. Up to this age there is practically no increase in frequency above the foetal rate of involvement for the different viscera Beyond the age of 40 there is a sudden increase of about 50 per cent in both sexes, the increase being somewhat more marked in the female than in the male

4 The two adhesions or bands found most often in both sexes at all ages are in the order of their frequency (1) gall-bladder to the duodenum and the transverse colon (2) gall bladder to the transverse colon It would appear therefore that these adhesions or bands are of congenital or developmental origin

5 The regions or quadrants of the abdomen most frequently involved by adhesions or bands in both sexes are, in the order of frequency of involvement as follows the right upper quadrant the right lower quadrant, the left upper quadrant, and the left lower quadrant

E. C ROSENOW, M.D

ROENTGENOLOGY AND RADIUM THERAPY

Edelken, L.: An Unsuspected Dermoid Cyst Diagnosed by Roentgen Examination. *Am J Roentgenol* 1922 n s ix, 15

This is the report of a case in which a dermoid cyst was discovered in the course of a roentgen examination for ureteral stone A number of undeveloped teeth embedded in a matrix of bone were seen in the roentgenogram The diagnosis was confirmed by operation

ADOLPH HARTUNG, M.D

Keith, D Y., and Keith, J P : Three Cases of Sarcoma Treated by Radiation. *Am J Roentgenol.*, 1922 n s ix, 31

Two of the three cases reported in detail were cases of melanosarcoma which had been operated upon repeatedly Following roentgen therapy the condition in both cleared up and the patients have remained well and free from recurrence to date one for five years and the other for two In order to obtain lethal doses within the tumor more than erythema doses of filtered rays were given by the crossfire method After all evidences of the growth had disappeared prophylactic doses were given at intervals

The third case was diagnosed as sarcoma and regarded as inoperable The growth, which was

enlargement of the axillary glands After repeated doses of roentgen rays producing a severe skin reaction the growth receded and about ten months after the beginning of the treatment the patient was completely free from enlargement in the pectoral muscle At the time this article was written a symptomatic cure had persisted for one year

ADOLPH HARTUNG, M.D

Van Zwaluwenburg J G : The X Ray Diagnosis of Accessory Sinusitis. *Am J Roentgenol* 1922 n. s. ix, 1

In order to clear up some of the confusion relative to the value of the roentgen examination in inflammation of the nasal accessory sinuses, the author reviews the subject in general endeavors to extend the application of the method by urging the adoption of a simpler but more comprehensive technique, and gives a detailed description of the findings on which he bases his interpretation. With regard to the technique he states that for accurate judgment the structures of the nose and all the sinuses must be demonstrated at a single routine examination the symmetrical parts must be compared and since the confusing shadows of the structures of the base of the skull and the cervical spine cannot be obviated by any one position or projection, there must be sufficient differentiation of these structures to permit the recognition and separate evaluation of their shadows.

The author believes these requirements are met by stereoscopic exposures in a sagittal projection with the forehead in contact with the plate changer and the direction of the shift cephalad Special stress is laid upon the use of a very fine focus tube as everything depends upon the fineness of detail in the posterior portion of the field

Satisfactory plates should show clearly and in good stereoscopic vision the lateral processes of the atlas and axis and the tip of the odontoid process. The latter should lie in the midline and should not reach above the lower third of the septum of the nose It is necessary to recognize clearly the structures of the upper nasal passages as well. In interpretation greater dependence is to be placed upon the changes in the bony structures than on the hazy opacities caused by the exudates and the soft tissue changes.

Considerable space is given to a consideration of the pathology of sinus infection in order to correlate the roentgen findings with such changes. Special emphasis is laid upon structural changes within the nose for upon these the tendency to chronicity is largely dependent. The roentgen interpretation must include a close study of those structures. Bone changes in the bony septa and walls of the sinuses are osteoplastic or osteoporotic, depending upon whether the condition is frankly purulent or tends to the hypertrophic type or so-called polypoid disease.

A frequent observation and one that appears to the author to be of first importance is the relatively small size of the chronically diseased sinus. This feature is always well marked in the juvenile cases, and when it is found in the adult a history of long standing disease dating back to childhood may be elicited almost invariably It is clearly the result of the inhibitory influence of the inflammatory process on the normal growth and development of the pneumatic structures. The result is frequently a high degree of asymmetry

Regarding the findings in acute purulent sinusitis the author states that the only changes that can be anticipated in the roentgenographic picture represent the shadows of the œdema and exudates in the sinuses replacing the air usually found there In exceptional cases the diffuse shadow of what is apparently the exudate of an acute infection is conspicuous and unmistakable A negative diagnosis, however is extremely hazardous. Sometimes the upright position and the horizontally directed ray will demonstrate a horizontal fluid level in the antrum Acute polypoid disease occurs infrequently and invariably escapes detection in the roentgen examination.

The signs of chronic purulent sinus infection are precisely those of an osteoplastic process in the corresponding chambers and the contiguous portions of the nose and frontal bone The increase in the density of the shadows appears to be due largely to the increased thickness of the walls of the sinuses. The contents of these chambers play little part in the total density The diffuse haziness that fills this region is due apparently to the thickening of the anterior and posterior walls rather than to the presence of retained secretions, except in the larger cavities of the maxillary sinus in which the contribution of the latter may be appreciable

While solitary infections occur, they are not so common as is commonly supposed group infections are the rule The association of the posterior ethmoid infections with infection of the maxillary suggests in some id osteo ss in the frontal sinuses, but the rest of the bony structures appear to be too thin to favor such a process elsewhere

[illegible] is not ne and olved [illegible]

quently found in the most posterior and external ethmoid cells. The frontal sinus often shows a [illegible]

appreciable shadow The main reliance for diagnosis must rest on the condition of the infundibulum which invariably shows distinct changes. The infundibular walls are early thickened and the cavity is obscured The irregular members of the anterior ethmoid-cell group which lie in immediate relationship to the infundibulum regularly show simultaneous involvement

The sphenoid is readily recognized by the use of stereoscopic plates and when infected shows increased thickness of its walls and much added

general density In exceptional cases the entire structure is represented by a uniform opacity in which differentiation between the wall and contents is impossible The distinction between a sphenoiditis and an intranasal opacity due to conditions such as polypoid disease may be extremely difficult The septum of the sphenoid is rarely made out because of its obliquity but occasionally may be seen Unilateral sphenoiditis presumably occurs but has not been recognized by the author An early extension to the other cell appears to be the rule

The differential diagnosis must take into consideration the rare cases of failure of aeration of the accessory sinuses and the persistence of cancellous bone throughout life The latter is seen most frequently in the maxillary sinus and presents a very confusing picture Usually it may be recognized by the uniform distribution of its shadows, the smaller size of the maxillary sinus on the affected side with resulting asymmetry and the absence of a definite cortical layer on both sides of the relatively thin wall of the normal antrum

The roentgenological appearance of chronic polypoid disease of the accessory sinuses is in marked contrast to the purulent type described The main features of the picture are due to the osteoporosis of the bony walls and the exclusion of air caused by the overgrowth of the mucous membrane In the roentgenogram this destroys to a large degree all the differentiating contrasts and details of the normal sinus cavities. The polypoid process involves the cells and their cavities and completely fills the upper nasal passages with hypertrophied and polypoid mucosa entirely closing the upper and middle meati By contrast, the excessive width of the lower nasal fossa due to the atrophy of the bony and soft tissue elements of the lower turbinates is accentuated The result is a diffuse hazy plate almost entirely lacking

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It is usually bilateral and symmetrical and rarely can one say with conviction that any one of the sinuses has escaped involvement The major

tural changes that have occurred in the bones of the skull These require time for their development and result from infections of considerable chronicity They do not regularly follow an acute sinusitis or repeated attacks of acute sinusitis of short duration. The roentgenogram of the sinus susceptible to recurrent attacks is quite as apt to show no appreciable changes during the free intervals The changes are in the nature of scars and may be expected to persist after the process which induced them has ceased It is therefore entirely conceivable that the sinuses in question in which definite changes have been demonstrated are entirely free from infection at the time they are examined The sinuses so recognized are therefore anatomically if not actually inflamed and deserve exactly the same consideration and treatment by the surgeon as those involved by a purulent process.

Andrew Hartwig, M D

Pfahler G E.: The Treatment of Carcinoma of the Thyroid by the Roentgen Rays and Radium. *Am J Roentgenol* 1922 n s ix, 20

The author has been unable to find in the literature any record of cases of carcinoma of the thyroid treated by radiotherapy His experiences have extended over a period of eleven years and his results have been generally most gratifying even though nearly all of the cases were regarded as hopeless

The histories of ten cases are reported in detail Practically all of the patients received some benefit One of them is alive and well two years after the treatment two others, three years one, four years, one seven years and one eight years In most of the cases the diagnosis was confirmed by previous operation and pathologic section

On the basis of his experience the author recommends the following technique

Three or more portals of entry should be chosen according to the amount and distribution of the disease A focal skin distance of 30 cm a 6-in parallel spark gap, 5 ma of current 6 mm. of filter and an exposure of twenty minutes should be used The treatments should be repeated over each area at intervals of a week if possible and each area should be treated three times The treatment should then be stopped completely for three or four weeks At the end of that time each area may be covered again twice in a similar manner If the disease localizes itself to a single nodular mass which ceases to respond to further treatment it is entirely practical to introduce radium needles directly into the tumor tissue and thus bring about a more thorough destruction of the cancer cells in the deeper portions Ten milligrams of radium element in the form of needles can be introduced into the tumor tissue approximately 1 cm apart and left in place six to eight hours, or 2 cm apart

that
soon

as possible at least two thorough courses of roentgen-ray treatment and more if the disease has not been completely removed so far as the surgeon can recognize it

2 If a diagnosis of carcinoma of the thyroid can be made without operation there is reasonably good hope of success from radiation treatment.

3 Recurrent cases can be made to respond to treatment and the recurrence can be made to

disappear but definite metastases in late cases are not apt to be controlled

4 Radium may be combined with roentgen ray treatment to good advantage in carcinoma of the thyroid when the tumor has become definitely localized and when it ceases to respond to the roentgen rays ADOLPH HARTUNG M D

Carman R. D: Benign and Malignant Gastric Ulcers from a Roentgenological Viewpoint *Am. J. Roentgenol* 1922 n.s viii, 695

Although the roentgenological distinction between typical cancer and typical ulcer is manifestly not difficult, the roentgen ray examination does not always determine the benignancy or malignancy of a given ulcerous lesion Between the classic tumor and the classic ulcer are innumerable gradations according to the predominance of one or the other feature. The ulcerous lesions are reported by the roentgenologist as ulcers because the characteristic niche-deformity is within the wall of the stomach When exposed at operation they generally have the macroscopic appearance of benign ulcer but microscopic examination of the tissue sometimes reveals cancer

Ulcers with microscopic evidence of cancer fall into two groups (1) ulcers in which both the floor and the border of the lesion contain cancerous tissue in abundance (2) ulcers in which cancerous tissue is found in the margin but not in the floor The second type has given rise to an extensive literature on the question of the development of cancer on ulcer Opinions vary from that of Hirschfield who denied any relation between cancer and ulcer to that of Zenker who maintained that most cancers develop on ulcers. Mayo Kuttner Payr Aschoff and Henke all agree that in these cases a diagnosis of cancer is impossible from the macroscopic examination alone and that the presence of malignancy can be definitely established or excluded only by microscopic examination

In the roentgen ray laboratory of the Mayo Clinic, well-defined ulcerous gastric lesions of the niche type are reported as "ulcer because the gross characteristics are those of ulcer and the clinicians and surgeons realize that the roentgenologist cannot determine whether the histologic picture is benign or malignant Gastric filling defects with palpable tumor are reported as cancer because experience has shown that 95 per cent of such tumors are cancers and the empirical element in the diagnosis is thoroughly comprehended by all concerned.

Some ulcerating cancers have gross characteristics of both cancer and ulcer When a cancer has under

peculiarities recently described by the author and considered by him to be pathognomonic (Fig 1)

If such a lesion is on the posterior wall near the lesser curvature or on the vertical portion of the

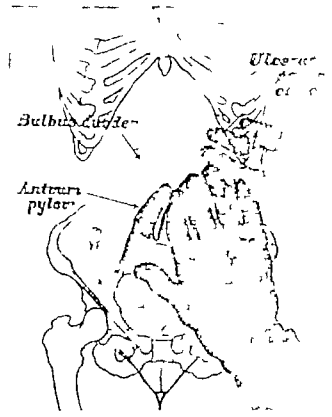
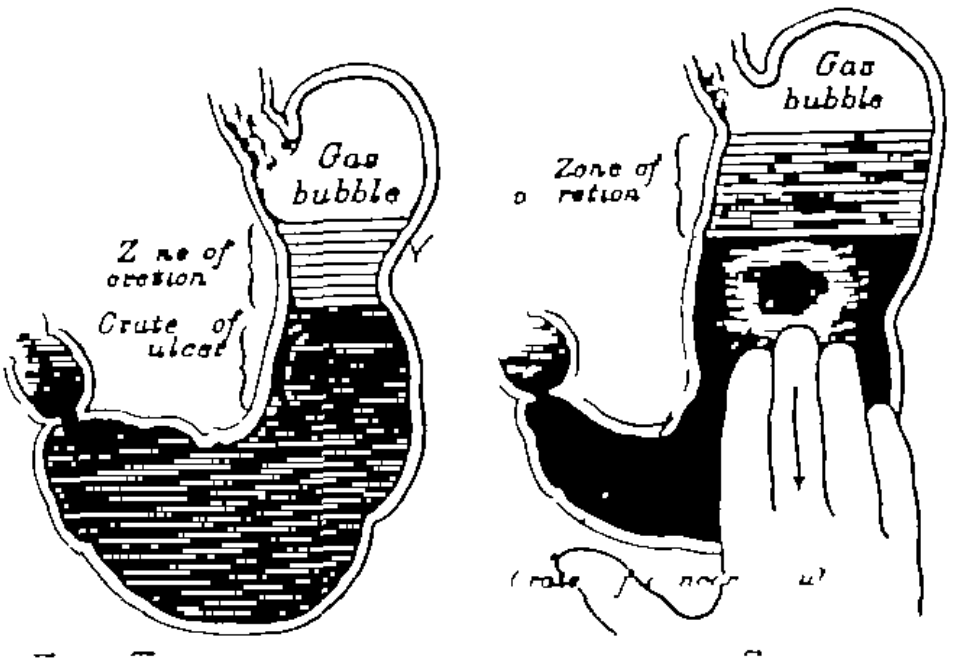


Fig 1 The demonstration of the lesion by palpation during roentgenoscopy

lesser curvature approximation of the stomach walls by palpation causes the crater of the ulcer to appear as a dark shadow resembling a meniscus as seen in profile (Fig 2) Its convexity is directed outward toward the gastric wall and its concavity toward the gastric lumen When the ulcer saddles the lesser curvature of a fishhook stomach distal to the incisura angularis the floor of the ulcer bends with the lesser curvature and its concavity is directed outward If the ulcer is high in the stomach on the posterior wall well away from the curvature thinning of the barium by manual pressure reveals the crater as a rounded dense shadow encircled by a lighter zone but no crescent is seen as in the edgewise view (Fig 3) When the patient is turned to the lateral view and the stomach is palpated the meniscus-like appearance of the crater may sometimes be obtained Modifications of this sign may result from variations of the pathologic condition or the situation of the lesion. The manner of palpation and the degree of pressure exercised also affect the outline of the visualized crater so that it may appear rectangular or biconcave The visualized crater in this type of ulcer differs from the classic niche type ulcer in three particulars (1) the crater is not within the wall of the stomach and therefore does not project from the visualized gastric lumen (2) in profile the crater appears as a meniscus and (3) it tends to retain its barium content during the palpatory manœuvres and is not easily emptied.



The niche type of ulcer produces virtually the same roentgenological manifestations whether it is benign or malignant When the niche representing the crater is 2 5 cm or more in diameter cancer is usually found in the ulcer on microscopic examination. Perforating ulcers producing an accessory pocket however large they may be, are seldom malignant

Cancers not mechanically obstructive are common, and a simple ulcer with hyperacidity and peristaltic vigor but the reverse also may be true

G H Jackson, Jr M D

Case, J T A Review of Three Years Work and Articles on Pneumoperitoneum *Am J Roentgenol* 9 2 n s viii 714

In an effort to sum up the present status of artificial pneumoperitoneum as a diagnostic aid the author gathered data from every available American source including information obtained from circular letters of inquiry sent to 223 roentgenologists The dangers, inconveniences, and contra-indications of the method as well as its field of usefulness were considered and special inquiry was made concerning the safety of this measure as an office diagnostic procedure. There seemed to be general agreement that the method must be pursued with due regard to the necessities of an aseptic surgical operation, excluding from the examination such cardiac or respiratory cases as would ordinarily be considered poor surgical risks that the gas used should be carbon dioxide or a mixture of carbon dioxide and oxygen that the amount of gas introduced should be carefully estimated that the injection should be done slowly, while the patient is carefully observed for signs of untoward effect

Among the inconveniences encountered distress either real or psychic, or anxiety on the part of the patient occupied a prominent place Pain, nausea vomiting, dyspnœa or profuse sweating were experienced by many patients, either singly or in combination, and none of the patients thus examined recalled the experience as pleasant. The discomfort was very much more marked when massive inflation was used than when only small amounts of gas were introduced The method is time-consuming and the cause of considerable inconvenience in the roentgen laboratory Aside from the distress, some of the inconveniences enumerated were due seemingly to errors in technique which might have been avoided Thus, the production of an interstitial emphysema or sudden overdistention can be obviated, and persistent overdistention may be relieved by deflation or by the use of carbon dioxide in place of oxygen.

Dangers which have been enumerated include the following intestinal puncture puncture of an omental or mesenteric blood vessel puncture of a

dilated ureter, the bladder or some other abdominal viscus peritonitis air embolism superficial emphysema rupture of malignant adhesions, and precipitation of cardiac failure through over distention of the abdomen Detailed accounts of instances of each of these are given

Four deaths directly associated with pneumoperitoneum have come to the author's notice One was due to the introduction of oxygen into the spleen and another to peritonitis In the two other cases there was some difference of opinion as to the exact cause, though both deaths were undeniably associated with an attempt to examine by the pneumoperitoneum method Particulars relative to all four of these cases are included

The reported fatalities incontestably mark the procedure of artificial pneumoperitoneum as one which should be performed only in an institution fully equipped for surgical operations and emergencies, and by men ready to assume at once the responsibility of dealing with such emergencies if they arise. Undoubtedly some of the accidents reported were the result of errors in technique yet those errors occurred in some of the foremost medical and surgical clinics of the world in the hands of men recognized as able to avoid such errors if indeed it is possible always to avoid them It may therefore be assumed that such errors are apt to recur from time to time in spite of all foresight and precaution.

As regards the indications for the use of pneumoperitoneum Case states that, generally speaking it is applicable in a selected class of cases of obscure abdominal or retroperitoneal conditions in which the careful use of all other clinical means has failed to elucidate the problem with any degree of satisfaction and where an exploratory operation does not seem preferable. Such conditions relate especially to lesions of the diaphragm other than subphrenic abscess, and obscure retroperitoneal lesions Certain lesions of the kidney and their differentiation from paravertebral masses are especially well illuminated by this method but the opinion is frequently offered that where the method has been used in urological work it has only occasionally added to the data already secured by other roentgenological or urological diagnostic means. The perfecting of the Potter Bucky diaphragm has been one of the most important factors in still further narrowing the field of usefulness of pneumoperitoneum, as good roentgenograms made with the Potter Bucky diaphragm show a wealth of detail surpassed only by plates made after gas inflation of the abdomen. Many laboratories have adopted the plan of trying the Potter Bucky diaphragm technique before resorting to pneumoperitoneum. The result has been that frequently the latter is not needed.

Abdominal ascites presents the least contested indication for the introduction of gas, which is easily and safely carried out in this type of case The method is probably next most useful to the gynecologist, especially when minimal amounts of gas are introduced by transuterine insufflation. Adhesions of the intestines to the abdominal wall are sometimes most strikingly demonstrated by pneumoperitoneum. ADOLPH HARTUNG M.D

Mallet L. and Collet, R.: The Value of Pneumoperitoneum in X Ray Diagnosis (Le pneumopéritoine en radio-diagnostic) *Bull et mém Soc de chir de Par.*, 1921 xlvii 1371

This report is based on a study of 144 cases The authors do not inject the gas under pressure directly into the abdominal cavity but use a method similar to that of Forlanini for artificial pneumothorax and the apparatus and trocar devised by Kuss. The site of choice for the puncture is in the left side of the great rectus muscle slightly above and to the left of the umbilicus and the left iliac fossa the patient being in right lateral decubitus The puncture of the skin is made very obliquely while that of the transverse fascia to the peritoneum is vertical Ten cubic centimeters of water are first injected and then 2 liters of oxygen or carbon dioxide or a mixture of both The authors prefer the mixture because it is absorbed more slowly The patient is examined in dorsal abdominal, and right lateral decubitus and in any other position that may be necessary The kidneys and liver are excellently outlined the gall bladder is visible in about half the cases the spleen can be seen clearly in ventral decubitus and by rotating the patient For the examination of the pelvic organs the patient is put in the Trendelenburg or genupectoral position in order to free the pelvis from the intestines In none of the 144 cases reviewed was there any accident.

In discussing this report Proust stated that in view of the fact that deaths have occurred after pneumoperitoneum the method should be used only when the patient can remain in bed for twenty four hours after the injection It is contra indicated in the cases of cachectic and anæmic patients and those with cardiac weakness respiratory complications, acute salpingitis, appendicitis or any other pathologic condition of the abdominal organs.

W A BRENNAN

Newcomet W S.: The Superficial Reaction of Radium as a Guide to Dosage *Am. J Roentgenol* 1922 n. s ix, 34

The effects of radium upon the tissues depend upon the following conditions (1) the amount of radium element or its equivalent that is used (2) the distribution of the radiating material (3) the time of application its duration and the intervals at which treatment is given, (4) the distance of the radium from the part treated and (5) the type of container filters etc. employed.

Any modification of these factors will produce entirely different results. The same number of milligram hours applied under similar conditions does not produce the same reaction if some of the factors mentioned are different

The character of the tissue must always be considered, especially when the parts have been subjected to previous irritation from other causes In some cases a late reaction and ulceration have been caused by the application of an irritant such as iodine, mustard, and excessive heat after radiation Due regard must be given also to the character of the tissues in the very old and very young The opinion seems to prevail that it is safe to make a second application after the lapse of three weeks, but in the light of very late reactions that have occurred in certain cases it is difficult to come to a definite conclusion In the folds of the axilla and groin the reaction is greater possibly because of the mechanical irritation of sweating rubbing or chafing

The foregoing deductions apply to normal structures in which more or less uniform results

Laboratory

ADOLPH HARTUNG, M D

Vlol, C H A Comparison of Radiation Dosages Attainable by the Use of Radium on and within Tumors *Am J Roentgenol* 1922 n s ix 56

The immediate problem in the radiotherapeutic treatment of a localized malignant growth is to secure an adequate or lethal dose of rays in the most outlying cells as failure to accomplish this leaves the patient in much the same predicament as that which results when the surgeon cannot excise all of the malignancy

If absorption is not taken into consideration the intensity of the rays from a small source varies inversely as the square of the distance from the source Since gamma rays of radium are so penetrating that the decrease in their intensity due to absorption in the tissues is markedly offset by the effect of scattered and secondary rays in the tissues, it is not necessary to consider absorption If the distance from the radium to the most outlying cells is set as 1 then the intensity of the rays on those cells is $\frac{1}{(1)} = 1$ If by insertion of the radium into the tumor mass the distance between the radium and the most outlying cells is reduced to one-half the intensity of the rays becomes $\frac{1}{(\frac{1}{2})^2} = 4$.

It follows then that with the same amount of radium inserted for the same length of time the ray dose applied to the most outlying cells will be increased fourfold

It is the utilization of this principle by multiplying the number of points from which the rays emerge that makes it possible to obtain almost homogeneous radiation and to secure the most intense effects of the radiation within the tumor thereby avoiding the great waste of rays that results when external crossfire is used and preventing the possible undesirable effects of these wasted rays in normal tissues adjacent to the neoplasm

The future developments in radium technique which promise most are those which will place the radio-active substance throughout the mass of neoplastic tissues. It is only in this manner that

ADOLPH HARTUNG, M.D

Thyroid diseases are classified under three heads (1) infla
Each of
tion of
given
the toxic or active types in forms of toxic adenomata and exophthalmic goiter

The toxic adenoma is characterized by a chain of

usually followed by improvement until the end of the second year when the second crisis comes From the second crisis the patient may alternately fail and improve or fail rapidly with cardiac and general degeneration

The thyroid is the regulator of metabolism and its functioning is well indicated by the metabolic rate McCaskey is quoted as stating that in 90 per cent of all cases showing an increase in the metabolic rate there is hyperthyroidism proportionate to the increase

The exophthalmic type causes an early slight increase in the blood pressure which is followed by a fall after the first crisis and then by another increase which is maintained

There are many theories as to the etiology One attributes it to the effect of conditions in goiter regions such as Michigan, Minnesota and Switzerland Another ascribes it to infections precipitated by violent emotions Disturbances of abdominal

viscera and disturbances of the endocrines at puberty pregnancy and the menopause have also been suggested as causes

In discussing the symptoms Loucks states that hyperthyroidism is suggested by a florid blotchy skin, tachycardia which is not dependent upon an organic cardiac lesion sweating palms longitudinal striæ of the nails and pain over the sternoclavicular joints.

Symptoms of a poor prognosis are (1) bulging of the eyes which has been present for two years or more, (2) a pale muddy complexion and œdema of the extremities (3) an irregular pulse rate of 140

)

increased cardiac impulse with accentuation of the second sound or both sounds (8) an apex rate of 180 and a pulse rate of 120 (9) urinary symptoms characteristic of failing heart action and a high metabolic rate (10) persistent diarrhœa (11) cerebral symptoms and acidosis and (12) a positive Wassermann reaction

Treatment should be begun by cleansing the bowels with a saline cathartic rest in bed a non protein diet an ice bag over the gland and precordia alkaline medication alkaline baths and medication in the form of bromides ergot or sodium cacodylate. If two weeks of such treatment does not overcome the toxæmia X ray treatment surgery or radium treatment is indicated

After careful consideration the author has come to the conclusion that the method of choice is the use of radium following the employment of the general methods mentioned for two weeks if necessary

At least 100 mg should be used in four tubes screened with 1 mm of brass and 1 mm of rubber at a distance of 2 cm from the skin Two or three ports should be irradiated from eight to ten hours each

Loucks then gives in detail the histories of five cases treated in the manner described

The results of radium treatment are summarized as follows

1 In the absence of permanent heart and kidney lesions, a high blood pressure was lowered

2 The blood pressure was raised when compensation was re-established

A marked increase of from 80 was lowered during the third and [illegible] during the next

4 A metabolic rate above 100 in cases of broken compensation was gradually lowered after the third week

5 In many very active cases the metabolic rate was normal after three months.

6 The metabolic rate is a standard of toxic activity and its measurement indicates further treatment verifies clinical findings and proves the results of treatment A J Larkin M D

Hanford C. W : Radium Technique in Treating Cancer of the Œsophagus: Preliminary Report *J Am M Ass* 1922 lxxviii 10

Except in the use of the fluoroscope we are working in the dark in the treatment of carcinoma of the œsophagus The thickness of the growth and its extent along the lumen of the œsophagus cannot be determined Data obtained from the few autopsies constitute the basis of the treatment of the case at hand Diseased areas are 1 to 2 in in length One portion of the wall is thick and will stand radiation which would have an unfavorable effect on thin portions of the dosage that a favorable effect is exerted on only the nearby tissue while a stimulating effect may be exerted on the more distant cells of the growth The minimal dose given must be sufficient to have a lethal effect on the most distant cells.

The author states that he is obtaining fair results in these cases with the aid of the fluoroscope dilators œsophagoscope and radium as a definite anticancer agent While many cases of this kind cannot be cured the canal can be kept open and gastrostomy can be made unnecessary by dilatation and the judicious application of radium

The five requisites for efficient œsophagus application as given by Mills and Kimbrough are as follows

1 Knowledge of the location extent and peculiarities of the tumor and of the location extent and direction of the stricture

2 Means by which the cancer stricture can be canalized harmlessly

3 Means by which the radium can be maintained in position

4 Means by which the applicator can be observed frequently while in position

5 Careful selection of dosage intervals etc

Methods employed in determining the location of malignancy in the œsophagus are (1) the use of the fluoroscope after the ingestion of barium or bismuth (2) sounding with olivary bougies and (3) œsophagoscopy (used chiefly to secure tissue for examination)

To locate the stricture a roentgenogram is made after the ingestion of bismuth With the patient before the fluoroscope the olivary bougie is passed on spiral wire and when the stricture is reached the site of the incisors on the wire is marked with adhesive. The wire is then removed and used to measure the radium carrier It is supposed that the malignancy extends below the point of stricture The author justifies the possible attack on normal tissue on the ground that such tissue will recover

If the olivary bougie will pass the stricture the radium carrier also will pass it. More often, however the stricture will not admit the olivary bougie or the radium carrier In such cases recourse is had to the method popularized by Sippy A silk cord (silk twist Letter D) is swallowed by the patient and after

illustration and description of the radium carrier are given The author states that the silk cord which is the only connection with the radium is much less objectionable than wire to hold the applicator in place To assure the proper location of the carrier during the application a roentgenogram should be made immediately after the application and again in six hours

Dosage is empirical The author has selected 50 mg for eight to ten hours If the lesion is longer than the applicator the radium is placed at the deepest portion in the first period of eight hours and then withdrawn its full length until the entire lesion is irradiated The radium is screened with 1 mm of brass and 1 mm of rubber The treatment is not fully satisfactory but improves the prognosis

Of fifteen cases four are seemingly cured All patients treated by the author were benefited Dysphagia was relieved and freedom from pain was secured for some time Second treatments were not so successful as first treatments Excluding the four cases believed to be cured, five went one year without recurrence In one there has been no recurrence for one and a half years These five are still under treatment The most encouraging feature is the relief of the dysphagia

The second treatment is given from three to four weeks after the first A J LARSEN M D

Stacy, L J The Treatment of Primary Carcinoma of the Vagina with Radium. *Am J Roentgenol* 9 2 p 1[illegible] 45

Primary carcinoma of the vagina is comparatively rare and reports of cases treated with radium are few only three having been found by the author in the American literature The course of the disease is very rapid glandular involvement occurs early because of the free lymphatic supply of the vaginal mucous membrane Surgical treatment has been disappointing and the cure of the local growth by means of radium is frequently followed by glandular involvement

Of the twenty-one patients with primary carcinoma of the vagina treated at the Mayo Clinic from July 1915 to January 1931 information concerning fourteen has been obtained recently in answer to questionnaires. Seven of the fourteen are living 1 three years and nine months, 1 two years and nine months, 1 two years and one month, 1 one year and two months 2 six months, and 1 five months since the treatment Of those who died, 1 died two years and four months, 1 one year and three months, 1 one year 2 eleven months, and 2 seven months after the treatment. Summaries of the histories of the fourteen cases are given.

which the emanation needles are buried in the growth or much larger doses of radium salt are employed The increasing efficiency of the roentgen treatment is also an important factor In the cases cited the local condition has been controlled comparatively successfully but extension into the glands has not been prevented

The author's conclusions are summarized as follows

Radium and roentgen treatments offer better chances for cure than surgery and as the technique improves a larger number of permanent cures should be effected

Better results are obtained and there is less danger of the formation of fistula if the initial treatment with radium is heavy and not repeated but the roentgen treatment of the abdomen and back is continued ADOLPH HARTUNG, M D

LEGAL MEDICINE

Courts May Order More Than One Physical Examination. *City of Valparaiso v Kinsey (Ind)* 171 *N L R* p 237

The Appellate Court of Indiana in reversing a

a second physical examination of the plaintiff by a physician or physicians to be appointed by the court The court stated that the only physical examination that had been made theretofore under an order of the court was had about eleven months after the plaintiff had received her injuries and nineteen months before the trial of the cause The injuries were of such a character that in the course of time

years after the injuries were received, would have been very helpful to the court or jury trying the cause

It is well settled in Indiana that a motion to require a plaintiff to submit to a physical examination in actions of this kind is addressed to the sound

one physical examination of a plaintiff in an action for damages for personal injuries It is apparent that

full truth concerning the matters in controversy When such circumstances exist the reasons which lead courts to assume authority to order physical examinations in the first instance afford ample justification for a further exercise of authority in that regard. J A CASTAGNINO

Liability for Burns from Fluoroscopic Exposures—Care Required *Evans vs Clapp et al (Mo)* 231 S W R p 79

The Kansas City Missouri Court of Appeals affirmed a judgment for $5,000 damages for the plaintiff against the defendants, a physician and a hospital company for alleged malpractice in the use of a fluoroscope which resulted in a burn. The plaintiff claimed that twenty exposures were made within eight days, while the physician insisted there were only eight exposures The plaintiff had gone to him to ascertain the cause of headaches from which she suffered, and on the first examination with the fluoroscope he found the cause a ptotic or low-lying stomach. As the roentgen rays were not applied in this case for treatment, but merely to ascertain the cause of the headaches, which was disclosed at the first examination, there was no reason to assume that an honest mistake had been made in the careful application of treatment. On the contrary as the roentgen ray revealed the condition at once the many other exposures were not made in the interests of the patient.

The rules governing the duty and liability of physicians and surgeons in the performance of professional services are applicable to them in the use and manipulation of a roentgen ray machine In employing this dangerous agency they must use such reason

however that the ordinary care required in the use of the roentgen ray would not be subject to quite the same distinction that is usually made between ordinary medical practice in a rural and in a city community as the standard of care in the use of roentgen ray machines must be derived from among the users thereof and the term "similar localities must in this connection have a somewhat general and relative meaning so as to include other users of such machines who possess the ordinary proficiency in and acquaintanceship with the use of that agency which obtains in similar localities or in the same section of the country J A. CASTAGNINO

GYNECOLOGY

UTERUS

Mathes, P Questions Concerning Prolapse and Retroflexion (Prolaps- und Retroflexionsfragen) *Zentralbl f Gyn* l 9 xlv 429

In the origin of prolapse in women who have borne children the most important factor is the bladder which, after the injuries caused by birth to the birth canal, favors prolapse by pressing on the surrounding parts Prolapse in a virgin finds its explanation in the presence of an abnormally deep cul-de sac of Douglas into which the intestinal loops thrust themselves forcing the uterus before them and out of the pelvis The deep cul-de-sac of Douglas is due to an arrest in development, a congenital variant which is associated with other signs of defective or arrested growth

From these observations it is clear that operative

favorable but the procedure presents technical difficulties He now advocates a combination of interposition of the uterus with the Goebell-Stoeckel plastic operation on the pyramidalis muscle proceeding from the standpoint that it is hardly possible to conceive of a better anchoring of the neck of the bladder the portion most in danger of prolapse than by loops of muscle and fascia

Three cases were operated upon in this manner successfully Mathes opinion as to the importance

entire obliteration and opposed effective resistance to the pressure of the intestines

For cases of uncomplicated retroflexion of the uterus artificial obliteration of the cul-de-sac of Douglas with fixation of the uterus by the Baldy Franke method is an appropriate procedure Among less difficult methods, which are also reasonably certain in their results, is the median colporraphy of Le Fort Neugebauer in which the anterior and posterior walls of the vagina are freshened and stitched together the vaginal walls thus being prevented from sliding upon each other The freshening must extend no further than to the lower third of the vagina the freshened wall is then used for perineoplasty All of the cases operated on by the Le Fort Neugebauer method (40 per cent of those treated during the last two years) have remained free from recurrence

Preliminary treatment is of the utmost importance for the successful outcome of any operation for prolapse All ulcers due to pressure must be healed and it is advisable also to render the cervix and corpus as aseptic as possible by the use of disinfectant washes Lindner (Z)

Garcia de la Serrana, M J A New Procedure for Fixation of the Uterus (Ein neues Verfahren fuer die Uterusfixation) *Zentralbl f Gynak* 1921 xl 1283

The method of fixing the uterus which has been worked out by the author stands, as he expresses it, "on its own feet." Provided the prolapse of the anterior and posterior vaginal walls is not too pronounced and the perineum still forms a fairly good support supplementary operations on the vagina and perineum are unnecessary Relapses, the author believes, are almost impossible after this procedure

An 8-in laparotomy incision is made upward from the symphysis The subcutaneous cellular tissue is separated from the fascia for a distance of 4 cm and the fascia muscle and peritoneum are pierced lat
pointed wi
round liga
ment and
touching the lumen and out on the other side, the abdominal walls then being pierced from within outward The abdomen is closed by layers of sutures and the wire twisted above the fascia so that the uterus is held firmly against the anterior wall in a somewhat elevated position and in anteflexion As the abdominal pressure then no longer operates on the retroflexed uterus pressing like a wedge on the vagina vaginoperineal operations are generally unnecessary

The laparotomy incision is made under local anesthesia, but narcosis is necessary when the uterus is brought forward Four cases have been treated by this method, two of them a year and a half ago In the cases of multipara the tube was ligated to produce sterility if this was desired The author

Kuliekamff (Z)

Bonney V The Radical Abdominal Operation for Carcinoma of the Cervix: Results of 100 Cases. *Brit M J* 1921 ii, 1103

The author compares the results of 100 cases previously reported by him and Berkeley with his own series of 100 cases on the basis of five years of freedom from recurrence

The operation performed for carcinoma of the cervix was the most thorough possible consisting in the removal of the uterus and its appendages the upper half or two-thirds of the vagina and the

The results are tabulated as follows

	Author's series	Joint series
Died of operation	20	20
Died of recurrent growth	33	32
Died of other disease	3	2
Lost sight of	4	7
Well after five years	40	39
	100	100

A comparison based on involvement of the regional glands is given in the following table

	Glands carcinomatous.		Glands not carcinomatous.	
	Author's series	Joint series	Author's series	Joint series
Died of operation	9	9	11	11
Died of recurrent growth	17	16	17	16
Died of other disease	1	1	2	1
Lost sight of	2	2	1	5
Well five or more years	9	7	31	32

The deaths from recurrence occurred in thirty three cases as follows

	Author's cases	Joint cases
Within 2 years	15	15
Between 2 and 3 years	12	10
Between 3 and 4 years	3	1
Between 4 and 5 years	3	6

Forty of the patients remained well after five years

The series of 100 cases reviewed in this article were selected from 160 consecutive cases presented for treatment In 1,000 cases of carcinoma of the cervix not operated upon the average length of life from the onset of symptoms was one year and nine months.

As the operation described is of great technical difficulty the results obtained show a gradual decrease in the mortality from 20 per cent in the first 100 cases to 6 per cent in the last fifty cases.

I E Burrow M D

Rawls, R. M : The End Results of Amputation of the Cervix and Trachelorrhaphy *Am J Obst & Gynec* 1922 iii 1

The author's plan of study was to classify and tabulate the immediate and end-results of 693 cases from hospital records. The personal equation was eliminated as in the great majority of the cases the findings were recorded by a number of examiners. The conclusions drawn are as follows

1 Amputation of the cervix and trachelorrhaphy are effectual and adequate operations and have a definite place in the gynecology of to-day

2 Secondary hæmorrhage and secondary union occur more often after trachelorrhaphy and are due *to faulty technique rather than infection.*

3 Improvement in the general health occurs in over 82 per cent of the cases treated by each operation but is greater after amputation of the cervix

4 Amputation of the cervix is more efficient than trachelorrhaphy in the cure of leucorrhœa and dysmenorrhœa but is more often the cause of these symptoms in cases previously free from vaginal discharge and menstrual pain.

5 Voluntary sterility is increased by cervical and vaginal plastic operations but all other things being equal, sterility is 11 per cent greater after amputation of the cervix than after trachelorrhaphy

6 Amputation of the cervix is followed by interruption of labor before full term more often than trachelorrhaphy but is no more liable to end in premature labor Abortion is more frequent after amputation in proportion to the number of high amputations.

7 Dystocia is greater after trachelorrhaphy as evidenced by the number of operative deliveries and by difficulty in spontaneous labor

8 With proper indications and technique low or medium amputation is as applicable to women in the child bearing age as trachelorrhaphy

C H Davis, M D

Keene F E. The Value of Radium in Gynecology *N York State J M* 1922 xxii 1

The author's observations since 1913 cover 501 cases of benign, and 412 cases of malignant, conditions of the female pelvis He states that radiotherapy has passed the experimental stage but it does not supplant or compete with surgery Disastrous results will follow the misapplication of radium or the X ray

that in the great majority of cases the results can be anticipated

Myomata contra indicating radium treatment are classified as follows

1 Tumors larger than a four months pregnancy and those which are complicated by inflammation or tumor of the adnexa

2 Tumors not producing hæmorrhage but whose *chief clinical manifestation is pressure.*

3 Tumors associated with cachexia out of all proportion to the amount of blood lost

4 Tumors distorting the uterine cavity so that radium cannot be inserted to the fundus.

5 Pedunculated tumors concealed within the uterine cavity or projecting from the cervical canal.

6 Calcareous or rapidly growing tumors associated with intermenstrual as well as menstrual pain.

7 Tumors in young women, since radium in sufficient amounts to affect the tumor may produce sterility or a premature menopause.

8 Tumors of moderate size in patients in whom the possibility of a gastric, gall-bladder or other extrapelvic abdominal lesion may suggest laparotomy In such cases operation is done and further procedure then decided upon

The use of radium alone is reserved for small uncomplicated tumors whose only symptom is hemorrhage, and for the so-called myopathic uterine hemorrhages Under these conditions 95 per cent of the cases are cured by one application In very rare cases myomectomy or hysterectomy must be done The technique of the radium treatment is as follows

Under nitrous oxide and oxygen anesthesia a careful pelvic examination is made Thorough curettage is done and the scrapings are examined microscopically A 50-mgm tube properly filtered is inserted to the fundus for twenty-four hours in the cases of patients at or near the menopause and for a proportionately shorter time in the cases of younger women In the cases of young women a second application is preferable to over radiation.

The patient is kept in bed for three days and allowed to go home on the fifth day Nausea or vomiting occurs in 60 per cent of the cases while the radium is in place An elevation of more than one degree of temperature is rare Pain in both sides of the pelvis for several weeks is usually due to undiscovered adnexal inflammation No irritable effects on the bladder or rectum have been noticed and no phlebitis or nephritis

The first menstrual period after the radiation may be the same or more severe The following periods are scanty or absent, and when a twenty four hour application is given the amenorrhea is permanent A second application is only occasionally necessitated by recurrence after several months Smaller doses reduce the extent and duration of the flow but not amenorrhea. Leucorrhea for six to ten weeks may complicate amenorrhea but it is not excessive or irritating The general symptoms are

of hemorrhage are cured. Re-application of operation is rarely necessary

2 A large group of myomata are operative cases.

3 In selected cases the myomata diminish gradually even to disappearance and the uterus suffers no ill effects from the radium

4 There is no mortality and a minimum of morbidity following radium treatment

5 The chief subjective symptoms are those of the menopause and are of relatively minor importance.

Malignant tumors are divided into two groups, the advanced cases beyond cure and the early cases Of the latter group the author does not speak as most of them are operated upon.

Women in the last stages have been given the temporary benefit of radium treatment but the author deems the practice unwise Among such cases are cases with extension to the bladder and rectum In rare instances a remarkable result is obtained even in this type.

In general 100 mgm have been used in these

given in six weeks The bladder and rectum are packed away with gauze

The results are pleasing to the patient even though in most cases they are only temporary Before the discovery of radium even this degree of palliation could not be obtained.

The gross changes in cancer of the cervix are briefly described Within a few weeks all superficial evidences of malignancy disappear and the ulcerated area is covered by a thin yellow membrane smaller than the original lesion and adherent to the adjacent tissues The vaginal wall close by is red and may bleed slightly on examination The profuse hemorrhage and malodorous discharge have ceased and have been replaced by a thin non-irritating leucorrhea. Several months later a pale contracted vagina due to fibrous tissue formation is usually found

Such local healing occurs in from 50 to 60 per cent of cancers of the cervix. In a larger proportion of the cases the malodorous discharge is stopped and never recurs or recurs only at varying intervals before death Pain is often relieved or lessened if

ever as fistulæ are more common in untreated cases Radium decreases the likelihood of fistula. Two deaths occurred soon after the radiation but both were those of extremely cachectic patients.

In early operable cases radium was used only once and this patient has passed the five-year period free from recurrence. Of ninety four women with inoperable malignant tumors of the cervix who

operation because of the danger of widespread sloughing of cells weakened by trauma. The author is still of an open mind as to pre-operative radiation.

The conclusions to be drawn from this study are as follows

1 As a palliative measure radium therapy is the treatment *par excellence* for inoperable cases of cancer of the cervix and vagina.

2 In borderline cases the use of radium is advisable but in certainly operable cases surgery with postoperative radiation is indicated

3 Cancer of the fundus is surgical except in the presence of a grave contra indication when radium should be used.

4 Hysterectomy is inadvisable in cases previously treated with radium

5 In the operable cases the advisability of pre operative radiation is still an open question.

6 Local irradication of cancer by radium is established and there is hope that cancer of the cervix may be treated by radium rather than by operation.

A J LARKIN M.D

ADNEXAL AND PERI-UTERINE CONDITIONS

Nash, W G : Hæmosalpinx and Pyosalpinx with Torsion of the Right Fallopian Tube. *Lancet* 1922 ccii, 78.

A single girl aged 18 was admitted to the hospital complaining of acute pain in lower part of the abdomen on the right side. Her history showed that she had had three previous attacks of the same kind one two years previously which had lasted fifteen hours, another one month previously and a third six days previously which caused vomiting

Menstruation began at 16 At first it was irregular but after the age of 17 became regular and profuse. At the time of admission to the hospital the temperature was 99.4 degrees F and the pulse 112

t

enlarged and purple due to its being twisted five and one-half turns the left tube was enlarged and adherent to the pelvic floor Both tubes were removed. The patient made a good recovery

The pathologist reported bilateral pyosalpinx and was intensely

The patient

[illegible] M.DREWS, M.D

Daniel, C.: Interstitial Pregnancy *Surg., Gynec. & Obst.*, 1922 xxxiv 15

The variable development of interstitial pregnancy and the symptoms peculiar to each case render clinical diagnosis almost impossible Even the macroscopic anatomy of the specimens presents obscure points. Vaudescal claims that microscopic examination is the only absolute means of confirming the presence of the condition

The author presents the history the findings, and photographs of two cases

In the early stage in almost all of the reported cases there was a short delay in menstruation followed by mild or profuse metrorrhagia The anatomical characters depend according to Vaudescal upon the point of primary implantation of the ovum. There are three principal characteristics which should be considered in the diagnosis, viz. asymmetry of the uterus asymmetry of the adnexa and lateral insertion of the round ligament

Uterine asymmetry or the Ruge Simon sign is characterized by elevation of the fundus on the side of the abnormal horn. Because of the abnormal insertion and the habitual tendency of an interstitial gestation to develop at first upward there is verticalization of the fundus of the uterus producing a cone-shaped organ

Asymmetry of the adnexa is caused by the drawing up of the tube on the gravid side by the development of the ovum

The insertion of the round ligament varies according to the attachment of the tube In general the round ligament is attached lateral to the foetal tumor and displaced laterally with the tube by the development of the ovum. Unfortunately these anatomical characteristics are of little clinical value except in the cases of thin women with a flaccid abdominal wall.

Microscopical study of an interstitial gestation should include a study of the ovular cavity the uterine cavity both tubes and both ovaries.

The ovular cavity is embedded in the musculature of the uterine wall and produces a slight decidual reaction at the point of implantation

Histologic examination shows that the tubes and ovaries are normal on both the gravid and non-gravid sides. Q H DAVIS M.D

Woolf A. E. M : Bilateral Interstitial Ruptured Ectopic Gestation Sacs. *Lancet* 1922, ccii 11

The patient had been married for seven years and had one child 6 years old On the morning of April 14 1920 (i e five days previous to her admission to the hospital) while dressing she was seized with sudden sharp pain in the left side of the abdomen which caused her to double up This pain lasted all day but passed off at about 7 p.m The following

quantity of dark-colored blood escaped. The right tube was seized and clamped In the intramural portion of both tubes ruptured gestation sacs were found. A large hæmatocele was present on the left

side and the pelvis contained numerous blood clots As the patient was in a precarious condition, the most rapid operative procedure was obviously essential A subtotal hysterectomy was therefore performed. The patient stood the operation well and made an uneventful recovery

The catalogue description of the specimen is as follows A coronal section of a uterus which was excised. In the wall there is on either side at the

shows to consist of chorionic villi The sac on the

Jayle, F., and Halpérine, J : Tubal Pregnancy and Blind Diverticular Canals of the Tube (Grossesse tubaire et canaux borgnes diverticulaires de la trompe) *Presse méd* Par 1921 xxv, 33

Medical literature is singularly deficient on the subject of anomalies of the fallopian tubes. One anomaly little known is the formation of blind accessory diverticular canals parallel with the normal canal of the tube. In exceptional cases there are two or more such diverticula.

Baudelocque first drew attention to these canals in 1825 by reporting a case showing bifurcation of the tube In 1898 Henrotin and Herz of Chicago reported an ectopic pregnancy in such a diverticulum In 1903 Henrius examined twenty five cases reported as cases of diverticula of the fallopian tube but found only five to be genuine.

In the authors opinion the development of ectopic pregnancy in a tubal diverticulum is not rare as they have observed four such cases in a short space of time Cases of this kind are not often reported because a very careful examination is necessary to discover the diverticulum and a search is seldom made for the malformation because it is not well known

The authors report the case of a woman 29 years of age in which a diagnosis of retroversion was made At operation the left tube was found to have three canals one of which had been ruptured by an extra uterine pregnancy W A Bardeen

Darnall, W E An Unusual Tumor of the Ovary *Virginia M Month* 1921 xlviii, 540

The patient was an unmarried woman 52 years of age, who had passed the menopause six years previously Being a Christian Scientist, she had refused to submit to surgical treatment for a fibroid tumor and had been given X ray treatments instead. These had produced a burn, the size of a saucer, which would not heal. The patient finally consented to an operation. An oval incision was made and the burned area dissected out down to the fascia

A large movable tumor was discovered attached to the left ovary with the elongated end of the left tube stretched over it. This growth, which was found to weigh 25 lbs and to contain creamy sterile pus, was removed. At its base several lumpy projections protruded into the pus cavity which were hard to the touch and cut like fibrous tissue The walls of the cavity were composed of fibrous tissue 1 in. thick

After a careful study of this case the conclusion was drawn that the tumor was originally a fibroid tumor of the ovary which ultimately began to degenerate from within, the injudicious treatment

The patient s recovery was uneventful. The skin incision united perfectly After a year and a half she reported herself in excellent health

C. H. Davis M D

Kerr J M M : Chorio-Epithelioma. *Lancet* 1922 ccii 9.

Two cases of vaginal removal of the uterus followed by recovery are reported. From these it is evident that the clinical features of chorio-epithe-

In cases the body expelled has been a vesicular mole. In a very few cases the tumor has developed after an apparently normal full-time pregnancy Prob-

ovum was still in the uterus. In rare cases the uterus has been found free of tumors, the primary

may cease for a time but soon recurs. Still later as the disease advances and ulceration occurs, pronounced anæmia and cachexia develop, with febrile pulse and temperature. At any time anomalous symptoms due to lesions in the brain lungs, or elsewhere may develop indicating that metastases in these organs have occurred

Of the author's eight patients two died as a result of the operation two died of metastases, two who were operated on many years ago are still alive, one who was operated upon a year ago is still well, and one has not been traced.

Taking early and late cases together a permanent cure may be expected in only about 30 per cent The outcome is therefore a little worse than in cases of carcinoma of the uterine body Kerr has performed vaginal hysterectomy three times and the abdominal

operation five times. In one of the worst cases the patient was so collapsed and anæmic that he performed the vaginal operation and employed clamps to control the blood vessels in the broad ligament

It is unnecessary to do a Wertheim operation in this condition as the glands are rarely if ever affected. Moreover it takes a considerable time and in all cases the shorter the duration of the operation and the less blood lost the better the chances of success. E. L. CORNELL, M.D

MISCELLANEOUS

MacKenzie D W: Vaginovesical and Utero-vesical Fistulæ. *J Urol* 1921 vi, 61

In this article attention is called to the fact that many patients with vesicovaginal or uterovaginal fistulæ have been operated on one or more times before they come under the observation of the urological surgeon One of the author's patients had undergone seven operations, another twelve and a third, with complete loss of the floor of the bladder had undergone eighteen operations before admission to his service

An important point emphasized is the necessity for definitely locating the ureteral openings and the vesical opening of the fistula and ascertaining possible facts regarding the course and positio the sinus before attempting operation. Atten is directed also to the necessity for improving condition of the tissues as much as possible be operation by means of urinary antiseptics and l treatment such as irrigations baths etc

When the opening of the fistula is high in fornix and there is much scar tissue the author m two free lateral incisions in the perineum—la episiotomy wounds He then places catheters in ureters and a catheter from the bladder to vagina through the fistula to serve as guides. bladder must be dissected freely from the vag unless this dissection is carried out thoroughly possibility of cure is remote The sinus is inve into the bladder and the vagina loosely sewed it The lateral incisions are then closed and vagina is packed with gauze

MacKenzie places great stress upon the p operative treatment because carelessness at stage may destroy all hope of final success. bladder is emptied by frequent catheterizatio with a permanent catheter and the patient kep bed from fourteen to eighteen days In his serie eleven cases there were no deaths

HERMAN L. KRETSCHMER, M.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Willson, P Uteroplacental Apoplexy (Hæmor
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On the basis of his study Willson draws the following conclusions

1 Uteroplacental apoplexy is caused by the inundation of the uterine wall with a toxin of the nature of a hæmorrhagin which is liberated by the placenta and produces its maximum effect of course at the site of its absorption and greatest concentration

2 In the great majority of cases, accidental hæmorrhage is probably a manifestation of the same process

3 Clinically the significant fact in the pathology is the damaged state of the uterine wall which tends to cause both intra-abdominal and postpartum hæmorrhage

4 In severe cases, with undilated cervix, the most conservative treatment is abdominal cæsarean section followed by hysterectomy if indicated, in order to assure certain hæmostasis

R E Cranford, M D

Yates, H W., and Connelly B.: The Treatment of Abortion. *Am J Obst & Gynec* 1922 iii, 42

In the series of cases observed there were eighty one abortions and 256 pregnancies during a period of four and one-half months, making the incidence of abortion 1 to 3.1 pregnancies Most of the cases occurred during the second month and the first half of the third month of pregnancy no doubt because of nutritional and circulatory changes About 25 per cent were criminal abortions

In cases of abortion due to malnutrition or some condition such as diabetes, tuberculosis or anæmia rest feeding and reconstructive medication are indicated Women who have shown an aborting habit should have an interval of one or two years between conceptions, and when pregnant should be kept in bed for several weeks under the influence of an anodyne Enemas but not cathartics should

be terminated

In cases of hypertension, nephritis hyperemesis gravidarum, and incipient tuberculosis the uterus should be emptied The best method is dilation or hysterotomy The use of rubber bags and bougies is unsurgical and slow and often necessitates later exploration In cases of certain complete abortion rest in bed for about ten days is all that is necessary In cases of incomplete abortion the sooner the uterus can be emptied the better If the cervix admits one finger the best procedure consists in removing the mass with a gloved finger under gas-oxygen anæsthesia If this is impossible the Longyear forceps may be used If the cervix is closed it should be packed with a strip of iodoform gauze and the gauze withdrawn in twenty four hours As a rule the products of conception will be removed with the gauze

Signs of infection are not the only signs of trouble for decidulitis and endometritis are often caused by retained placenta which should be removed

Barring criminal abortion, neglected incomplete abortion is the most potent factor in sepsis as the small retained products are a fruitful culture medium for pyogenic bacteria The author never uses intra-uterine douches in cases of septic abortion He prescribes rest in bed opiates enemas, and large hot packs over the entire abdomen If the peritoneum is involved he advises hypodermoclysis, glucose and bicarbonate of soda by rectum morphine to tolerance and liquids by mouth

The morbidity which results from all types of abortion is appalling It is greatest in the incomplete and septic cases

To decrease the incidence of criminal abortion, patients should be told of the sequelæ of the contemplated act especially as regards the wrecking of their health C H Davis M D

LABOR AND ITS COMPLICATIONS

Crawford M A. D : Spasmodic Stricture of the Uterus. *Brit M J* 1922 i, 135

This condition was first described by Smellie in 1743 It is designated by various names but the author prefers DeLee's term stricture uteri, or

normal contour In the majority of cases it occurs at the same site as Bandl's ring i e at the juncture of the lower and upper uterine segments

The case reported by the author was that of a woman who had borne four children. The first child

OBSTETRIC

PREGNANCY AND ITS COMPLICATIONS

VIII

Obst 1922 xxxiv 57

On the basis of his study Willson draws the following conclusions

1 Uteroplacental apoplexy is caused by the

at the site of its absorption and greatest concentration

2 In the great majority of cases, accidental hemorrhage is probably a manifestation of the same process

3 Clinically the significant fact in the pathology is the damaged state of the uterine wall which tends to cause both intra-abdominal and postpartum hemorrhage

4 In severe cases, with undilated cervix the most conservative treatment is abdominal cesarean section followed by hysterectomy if indicated, in order to assure certain hemostasis

R E Chamnin, M D

Yates, H. W., and Connally B.: The Treatment of Abortion. *Am J Obst & Gyn* 1922 iii, 42

In the series of cases observed there were eighty one abortions and 256 pregnancies during a period of four and one half months, making the incidence of abortion 1 to 31 pregnancies Most of the cases occurred during the second month and the first half of the third month of pregnancy no doubt because of nutritional and circulatory changes About 25 per cent were criminal abortions

In cases of abortion due to malnutrition or some condition such as diabetes, tuberculosis, or anemia rest feeding and reconstructive medication are indicated Women who have shown an aborting habit should have an interval of one or two years between conceptions, and when pregnant should be kept in bed for several weeks under the influence of an anodyn Enemas but not cathartics should be given Uterine *usually abort in the later months* of gestation, but should receive intensive treatment until the Wassermann test is negative In old cases treatment is of little avail and the pregnancy should be terminated

In cases of hypertension nephritis, hyperemesis gravidarum and incipient tuberculosis the uterus should be emptied The best method is dilation or hysterotomy The use of rubber bags and bougies is unsurgical and slow and often necessitates later

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infant mortalities was a lesser object. Full tables are given of the following groups of cases

1 Contracted pelvis (a) after attempted delivery with forceps or by craniotomy, (b) after induction of labor (c) lower uterine segment operations, (d) cases of cæsarean hysterectomy and (e) fatal cases.

2 Cases of eclampsia and other toxæmias of pregnancy

3 Cases of placenta prævia

The number of cases in which the operation was performed for pelvic contraction was 3 972 The maternal mortality was 139 (4.1 per cent) The mortality rate for the series as a whole however does not yield much information it is necessary to classify the cases

Maternal Mortality Contracted Pelvis

	Total cases	Maternal deaths	Mortality Per cent
Not in labor	1,202	19	1 6
Early in labor	389	7	1 8
Late in labor	220	22	10 0
After induction of labor	35	5	14 0
After attempts at delivery by forceps or craniotomy	107	29	27 0

The important points so far brought out by this analysis are (1) the mortality of the operation *per se* has decreased, being now only half that in the cases collected by Routh up to 1910 (2) the mortality after long labor or attempts at delivery remains as high as ever The 27 per cent mortality after attempts at delivery is a serious warning The fœtal mortality when forceps were tried was 27 per cent, and the early mortality of the infants who survived delivery nearly 11 per cent.

In 196 cases of eclampsia there were sixty three maternal deaths deducting one case of postmortem cæsarean section, the maternal mortality was sixty two deaths in 195 cases (31 8 per cent) Again deducting five cases of vaginal cæsarean section with one death, the maternal mortality of abdominal cæsarean section for eclampsia was sixty-one deaths in 190 cases (32 per cent)

One hundred and forty seven (75 per cent) of the patients were primigravidæ twenty six had had from two to five children and nine had had from six to nine children Regarding the parity of fourteen there is no record

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There were 208 cases of antepartum hæmorrhage comprising 139 cases of placenta prævia, sixty six cases of accidental hæmorrhage and three cases of free intraperitoneal hæmorrhage. In two of the latter the bleeding came from a ruptured vein on the wall of the uterus in the third the source of the bleeding was not found

Maternal Mortality of Placenta Prævia

Type	Cases	Deaths	Mortality Per cent
Complete and central	78	11	14 0
Incomplete, etc.	43	4	9 3
Type not recorded	18	1	—

The number of children to be considered was 138 (no record regarding the child in one case and twin pregnancy in one case) The number of fœtuses born dead was ten a fœtal mortality of 7 per cent The number of children who died during their stay in the hospital was twenty nine, an infant mortality of 22 3 per cent among the 128 children who survived birth

The very low fœtal mortality is, of course extremely flattering to cæsarean section as the mortality associated with the more conservative methods of version and the use of hydrostatic bags is generally given as from 40 to 60 per cent

In sixty-six cases of accidental hæmorrhage there were eighteen maternal deaths, a mortality of 27 per cent Among the fifty-eight cases of concealed and concealed and revealed hæmorrhage there were seventeen deaths a mortality of 29 per cent Among the eight cases of accidental hæmorrhage the mortality was 12 per cent.

The striking point brought out here is that the mortality after cæsarean hysterectomy (46 per cent) was about four times as great as that after simple cæsarean section.

The fœtal mortality among the cases of concealed and concealed and revealed hæmorrhage was extremely high 86 per cent

In the remaining 366 cases the indications for operation were so many and various that a satisfactory classification is not easy They are grouped as follows

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2 Grave diseases threatening the mother sixty one cases.

3 Fœtal states other than those included in 1 (b) twenty cases

4. Rupture of the uterus, nine cases

5 Miscellaneous indications seventeen cases.

Of the eighty-eight women with fibromyoma of the uterus, nine died a mortality of 10 per cent In forty two cases hysterectomy was performed with four deaths in twenty three cases myomectomy with three deaths and in the remaining

one was delivered in a case of degenerating fibromyoma The woman with the degenerating fibromyoma died on the second day

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four "ovarian tumors four carcinomata, and one sarcoma The maternal deaths in the whole series numbered seven, the foetal deaths four and the infant deaths one In figuring the mortality it is not fair to include the five malignant tumors which accounted for two maternal deaths and one foetal death In the thirty-six cases of benign tumors there were five maternal deaths, a mortality of 14 per cent

Ten cases of tumors of the bony pelvis were as follows three cases of osteoma of the pelvis, three

no maternal, foetal or infant deaths In five cases the labor was obstructed and in five it had not begun

In the twenty-five cases of carcinoma of the cervix there were six maternal deaths four stillbirths and ten subsequent deaths of infants In nine cases cesarean section was followed by radical abdominal panhysterectomy (Wertheim's operation) in one case the growth was in an early stage and radical operation was postponed in the remaining fifteen cases the growth was inoperable In the latter fifteen cases simple cesarean section was performed in six and cesarean section followed by subtotal panhysterectomy in nine

There were eight cases of carcinoma of the rectum and colon with no maternal deaths Two children died later from prematurity In one case colotomy was performed at the time of the operation, and in two cases colotomy had already been performed a few

five

no

tumor in the anterior wall of the bladder had obstructed labor for three days It was not removed There was one case of obstructed labor due to a four and one-half month's tubal abortion." In another case there were four unclassified pelvic tumors

Alterations in the axis of the canal due to operations were present in thirteen cases of ventrofixation two of ventrosuspension, one of Gilliam's operation and three of the Schauta-Wertheim interposition There was no maternal or foetal mortality but four children (two of them twins) died later In two of the ventrofixation cases there was also cicatricial contraction of the cervix due to previous amputation and in one of these there was doubt as to whether the amputation of the cervix or the ventrofixation was responsible for the obstruction of labor

There were four cases of narrowing due to vaginal and perineal operations None of the mothers died

In three cases of contraction or retraction rings there was no maternal death and only one foetal death

In three cases of congenital malformations of the uterus and vagina there were no maternal or foetal deaths

In nine cases of rigidity or stenosis of the cervix or vagina all the mothers and children lived

Among the sixteen cases of excessive size of the foetus there was only one maternal death the operation was undertaken as a last resort after the use of forceps, perforation decapitation, and cleidotomy had failed to deliver the foetus.

In malpresentations the results were as follows

1 Occipitoposterior presentation. In two cases the forceps had failed both mothers lived and one child died after a few hours from cerebral hemorrhage

infants lived

4 Transverse presentation Two of the five mothers died from general peritonitis, two of the foetuses were born dead and one child died later Four of the patients had been very long in labor and one had just begun labor One death was that of a woman with tonic contraction of the uterus and impending rupture, and another that of a woman who had been in labor for four days.

There were four cases of hydrocephalus with no maternal mortality forty cases of cardiac disease with a maternal mortality of nine (22 5 per cent) one still-born foetus, and six subsequent infantile deaths.

Representing other grave maternal diseases there were twenty-one cases with nine deaths

In ten cases of previously repeated foetal death during labor one mother died from subacute yellow atrophy of the liver and two children died

In two cases of prolapse or presentation of the umbilical cord there was no maternal mortality One child died

In two cases of hydramnios both mothers and one child lived

In one case of missed labor the mother lived. The foetus was macerated.

A summary of nine cases of ruptured uterus shows that two mothers died, five foetuses were born dead, and two children died later The cause of the rupture was stated to be brow presentation in two hydrocephalus in two difficult forceps delivery in two, and contracted pelvis in one. For two no cause was stated

There were seventeen cases classed under miscellaneous indications In this group there were no maternal or foetal deaths the only child which died in the hospital was one delivered in a case of pain due to adhesions following the removal of a suppurating appendix. E L Cornell, M D

Bainbridge J B : Cesarean Section in Infected Cases of Obstructed Labor *J Obst & Gynec Brit Emp* 1921 xxvii 5 3.

Authorities do not agree regarding the justification for an immediate cesarean section in cases of

obstructed labor, especially in 'septic' or 'suspected' cases.

Routh reported that he found a maternal mortality of 34.7 per cent in cases in which infection might have been presumed before surgical methods were adopted. Consequently many authorities hold that some radical operation should be performed to minimize the risk of a fatal termination through sepsis. Bannister believes that such a view is unnecessarily pessimistic, and puts forward his own experience to justify this opinion. He regards the classical operation as the best and safest under such circumstances. The modified technique adopted is as follows:

The vulva and vagina are first thoroughly swabbed out with antiseptic fluid with the patient under anæsthesia. The abdomen is then painted with the same fluid, and an incision of sufficient length to permit easy eventration is made. After this, a large towel is laid behind the eventrated uterus and drawn forward around the cervix to protect the peritoneal cavity from the liquor amnii. After the uterus has been emptied, the whole interior and the edges are swabbed with the antiseptic fluid and the wound is closed according to the classical method. Saline solution is then poured over the uterus, the towel carefully removed and the abdominal wound closed in layers without drainage. In the suturing linen thread or silk has been used in all cases but silkworm gut is even safer.

The author gives the history and notes of nine cases all presumably 'suspect' cases before operation. Many of the patients developed symptoms and signs of septic absorption, but the final result was good; several showed healing of the wound by first intention.

C. H. Davis, M.D.

Whitehouse, B.: Cæsarean Section in the Treatment of Placenta Prævia. *J. Obst. & Gynæc. Brit. Emp.* 1921, xxviii, 469.

After reviewing the subject of cæsarean section in the treatment of placenta prævia since the time of Tait, the author gives his own opinions formed from a careful study of the annual reports of the Birmingham Maternity Hospital for the last ten years and his personal experience.

At the Birmingham Maternity Hospital eleven methods of delivery were employed with the following results:

Method	Cases	Fœtal deaths N	Fœtal deaths Per cent	Maternal deaths No	Maternal deaths Per cent
Version	211	193	91 4	9	4 3
Natural	35	16	45 7	0	0
De Ribes bag	15	11	73 3	3	20 0
Rupture of membranes.	11	9	81 8	0	0
Forceps	9	9	100 0	2	22 0
Cæsarean section	5	2	40 0	3	60 0
Vaginal cæsarean section	4	2	50 0	0	0
Induction	2	1	50 0	0	0
Extraction of breech	2	1	50 0	0	0
Vaginal pack	1	0	0	0	0
Hysterectomy	1	1	100 0	1	100 0

The method of choice was version, but its fœtal mortality (91.4 per cent) is appalling.

In fact the fœtal and maternal mortality of the five most common methods of delivery viz. version, natural, De Ribes bag, rupture of the membranes and forceps averaged 84.7 per cent and 4.9 per cent respectively. Furthermore as placenta prævia accounted for 31.3 per cent of the total number of still births occurring in this hospital during the ten years under consideration (715 in number) the problem of treatment is of considerable importance.

The first step to be taken to lower the mortality rates is early diagnosis. Every case of antepartum bleeding calls for a thorough examination. Furthermore, placenta prævia must be recognized, if pos-

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[illegible] have been most gratifying but there are many limitations to this form of treatment. Lateral or marginal placenta prævia does not usually call for this operation and certainly cæsarean section is not indicated after an initial severe hæmorrhage when the lives of both mother and child are threatened. The author reserves it for cases with symptoms from the eighth month of pregnancy and in which the first hæmorrhage has not been so severe as to endanger the viability of the child. Acting on these indications he operated upon nine cases of central and lateral placenta prævia during the last three years. All of the mothers recovered and eleven children were born alive although only nine survived. One infant died a few hours after birth and another seven days after delivery.

Harvey B. Matthews, M.D.

Kerr, J. M. M.: The Lower Uterine Segment Incision in Conservative Cæsarean Section. *J. Obst. & Gynæc. Brit. Emp.* 1921, xxviii, 475.

lower uterine segment. The subject is taken up under the following heads:

1. Evidence that the uterine scar in the classical cæsarean section is often unsatisfactory.
2. Reasons for the defective cæsarean scar.
3. The means by which a better scar can be secured with the usual longitudinal cæsarean incision.
4. The lower uterine segment incision is the best

sound a scar as is generally supposed and frequently gives way completely or partially. Holland traced 1,103 women who had undergone cæsarean section and found that eighteen of 448 (4 per cent) had ruptured scars during subsequent pregnancies or labors.

The reasons why the uterine scar is so frequently defective include

3 Difficulty in approximating the uterine wound whenever the uterus begins to contract

4 Incomplete hæmostasis Coaptation and hæmostasis must be accomplished by the same suture

5 Implantation of the placenta on the anterior uterine wall. This occurs in 40 per cent of cases Bleeding is apt to be excessive and the wound very difficult to suture

The means by which a better scar can be secured in the usual longitudinal cesarean incision are

1 The prevention of infection by improved surgical technique and teamwork, prenatal care, and delivery of the placenta and membranes through the vagina

2 The suturing of the uterine wound in layers

3 The use of chromic catgut in the suturing of the mucous membrane of linen or silk in the suturing of the muscle and of catgut for peritonization of the uterine incision

4 Suturing of the uterus while it is in a state of retraction as distinguished from that of contraction.

Pituitrin is contra-indicated as it causes very great difficulty in the suturing of the uterine wound

The lower uterine segment incision is the author's choice because a firmer better cicatrix results and therefore rupture is less apt to occur The transverse lower uterine segment incision is advocated as it causes less bleeding this part of the uterine wall is thinner and therefore easier to suture. A wound in this region is at rest during the early days of the puerperium, and as this portion of the uterus does not become fully stretched until labor is well advanced the scar [illegible]

1 Technically it is more difficult to perform than the classical cesarean section and therefore requires more time

2 It is more apt to be associated with disturbing hæmorrhage if the incision is not carefully made.

3 It is quite difficult when there is little or no cervical dilatation.

4 Occasionally it is impossible to deliver the head through a transverse incision in the uterus. The author had one such case and was compelled to extend the incision longitudinally

HARVEY B MATTHEWS, M.D

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Levy C S. Essential Hæmaturia A Clinical Study
Surg Gynec & Obst 1922 xxxiv 22

Essential or idiopathic hæmaturia is renal bleeding for which a cause cannot be determined Pathologically the findings in such cases vary A chronic passive congestion due to obstruction of the urine or blood varices of the papillæ congestion secondary to cardiac lesions, hæmophilia angio-neurosis ureteral stricture and prenephritic conditions have all been described, but none of these could be the causative factor in all cases. In some instances the kidneys are apparently normal.

The diagnosis is always made by exclusion and should be made only after all known urological tests have been found negative.

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were followed for a period ranging from one month to thirteen years. A fair conclusion as to the sex incidence of the condition could not be drawn as most of the subjects were patients in a male urological clinic. In 36 per cent of the cases the onset of the hæmaturia occurred in the fourth decade of life. In the majority there were no other symptoms besides the hæmaturia Nearly all of the cases developed spontaneously and it appeared that exertion was of little importance as a causative factor The kidneys were involved about equally but in no case were both of them affected

Operative procedures consist of decapsulation nephrotomy, and nephrectomy The latter is indicated only as an emergency measure to prevent exsanguination. Non-operative measures are the methods of choice. These consist of the intrapelvic injection of silver nitrate and adrenalin the passage of the ureteral catheter the oral administration of calcium lactate, and subcutaneous or intramuscular injections of horse serum Preference is given the intrapelvic methods. When these are employed the kidney pelvis should be completely distended

Of the author's thirty patients twelve have had no recurrences of the hæmaturia, while eighteen have had subsequent attacks. Spontaneous cessation of bleeding occurs not infrequently and the general health is usually unaffected Analysis of the questionnaires led to the inference that none of the patients has developed nephritis renal or ureteral calculus, tuberculosis or renal tumor and none has had an operation on the genito-urinary tract. In spite of the loss of blood and recurrences, the prognosis is favorable.

Several interesting tables are included in the report N K. Foerster M.D

Am M 1st 1922 lxxvii, 266

During the course of numerous experiments on the localization of bacteria from various diseases instances of extremely specific effects were noted Some of these observations suggested that urinary calculi may be due to prolonged low-grade infection by bacteria having elective affinity for the urinary tract and the power to cause the precipitation of calcium

Accordingly teeth in dogs were devitalized and infected with cultures of streptococcus freshly iso-

calculi were found in both kidneys The size varied from small concretions to stones measuring 3 by 7 mm and was roughly proportional to the duration of the experiment. The findings in these dogs resembled those in patients with nephrolithiasis The stones were hard angular and rough, and of a chemical composition similar to that of the stones formed in nephrolithiasis in man The evidence of infection of the urinary tract and the lesions in the kidney were slight except when obstruction in the ureter had been caused by an impacted stone

The causal relationship between the calculi and the streptococcus inoculated into the teeth seems established The organism was isolated from the kidneys, from some of the stones and from the teeth of the dogs, and its elective affinity for the medulla of the kidneys of rabbits on intravenous injection was demonstrated The organism was found in the lesions of collecting tubules where crystallization and stone formation were beginning Precipitation and crystallization of calcium always occurred in areas with little or no cellular reaction

Stone was not developed by any of the four dogs whose teeth were infected with streptococci isolated from patients with arthritis or any of the four additional control dogs which were kept under the same conditions, but whose teeth were not infected The urine of all of these eight dogs remained normal and the kidneys showed no focal lesions

Stones of the character obtained in these experiments were not found in another series of fourteen dogs which were kept under similar conditions and whose teeth were devitalized and infected with strains other than those from nephrolithiasis and nephritis, nor in a single instance in the examination of more than five hundred dogs used for other experiments.

It is not clear why four dogs which were infected with the streptococcus of arthritis failed to develop

arthritis There was active infection around the *teeth in all instances* and *the staphylococcus from* the pulp chamber in one of the dogs inoculated four months previously retained its affinity for the joints of rabbits on intravenous injection It would seem therefore, that the joints of these dogs were not affected because of the high resistance of these structures to invasion by this organism during the relatively short duration of the experiment, and not because of encapsulation or loss of specific localising power

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intercurrent infection At the end of the experi ments an active process was found in the devitalized

lar sockets the infection caused rarefaction and

tera of well formed granulomata were strikingly similar

Barney J D. Recurrent Renal Calculi. *Boston M & S J* 03 clxxvi, 9

Barney has reviewed 139 case reports of renal stones obtained from the records of the Genito-Urinary Department of the Massachusetts General

Only eleven of those studied by Barney were over 50 years of age the majority being between 21 and 30

Attention is called to the fact that many intra abdominal conditions simulate renal calculus and that in some instances the best surgeons err In a previous study Barney found that 18 per cent of patients with renal stone had had some previous

infection in the right side of the abdomen and renal stones as frequently both the urine and the X ray findings are negative

In Barney's opinion, an exploration, especially of the appendix, is sometimes necessary By such an ent In be nal

stone is present, especially if the symptoms have been present for years

In reviewing his case reports Barney was impressed with the mildness and the duration of symptoms presented in many instances In four cases the symptoms had been present for less than a week in nine for two months in eighteen for six months and in eight for a year In thirty-nine cases they had been present for three years in eleven for five years In fourteen, for ten years, and in seventeen for a number of years Renal stone may be most insidious and may acquire an enormous size without causing noteworthy symptoms

Barney found that small stones produce symptoms more frequently and more severe symptoms than large stones The most common symptom is pain It must be borne in mind, however that pain radiation may be to any other organ in the abdomen or to any other part of the abdomen—in some instances to the kidney on the opposite side. Barney finds that the first indications of stone in the urinary tract may be hematuria dysuria, chills, and fever frequent urination, and sometimes retention.

Tenderness was found in only 43 per cent of the cases. Pus was the most frequent element in the urinary sediment. It was found alone fifty nine times and with blood forty-one times. Blood was found alone twenty-six times. In twelve cases (8.6 per cent) the urine was persistently negative.

and in some instances, even when combined with

As superimposed stones may throw a single shadow a

two kidneys may be ascertained it gives correct information concerning infection of the kidney determines the patency of the ureter reveals the separate function of each kidney and makes pos-

tion of the kidney pelvis, etc. An experienced

not necessarily cause bilateral symptoms. In twenty four instances the only stone or one of several passed

of choice, was done in sixty four instances and pyelotomy and nephrotomy were done thirteen times There were thirty nine nephrectomies and seventeen nephrotomies, three of which were bilateral

In the author's experience, pyelotomy is sufficient for the removal of small calculi even when they are multiple. Nephrotomy is necessary only when the stone is of such size and shape as to make its extraction through the renal pelvis impossible Nephrectomy was done when the kidney was badly infected and harbored a very large stone or many small ones. Postoperative complications found by Barney were various in character and cause the list including exacerbation of pre-existing infections requiring nephrectomy and hæmorrhage after nephrectomy

The mortality from multiple stones was 3 5 per cent which the author considers not discouraging Two of the deaths were due to pneumonia one to uræmia one to hæmorrhage after nephrotomy and one to gas-oxygen anæsthesia

Abnormalities of the kidneys were found in five instances horseshoe kidney in three and an aberrant artery in two None of these abnormalities was discovered before operation

Barney states that a review of the results of operation for renal calculus is not inspiring The number of patients in whom subsequent examinations showed the presence of one or more calculi is appalling Although conditions which produce stone are not removed when the stone is extracted it is Barney's opinion that whatever operation is done it often does not remove all the stones To prove this statement he cites the fact that of twenty of his patients who were X rayed during convalescence nine (45 per cent) still showed stones and that in 50 per cent of those who were subjected to pyelotomy stones were subsequently found in the kidney

All patients should be X rayed during convalescence because if a stone is revealed by the X ray six months or a year after operation it is impossible to tell whether it was left at operation or is a recurrence. Although an X ray examination was not made soon after operation in most instances, Barney found what was believed to be a recurrence in 32.8 per cent of the cases in which a pyelotomy was done.

Following nephrotomy recurrences were found in 56 per cent of the cases by Cabot and Crabtree and in 30.3 per cent by Barney

Barney studied seventy cases treated by nephrotomy at the Massachusetts General Hospital from 1897 to date. The ages of the patients ranged from 11 to 64 years. The operative mortality was 5 7 per cent Recurrence or overlooked stones were found in 52 9 per cent of the cases. This fact and the ever present danger of hæmorrhage indicate that the

a nephrectomy is necessary to arrest it.

After reviewing the situation from the point of view of both pyelotomy and nephrotomy Barney states the reasons why the removal of stones from the renal pelvis is not always possible as follows

1 The renal pelvis is a very complex cavity with various ramifications in the form of calyces. Calyces may branch at right or acute angles from the plane of the pelvis. A probe may fail to find the orifice of the calyx either because of its minute size or because of its location. In either event a stone remains undetected

2 One may see a very definite shadow of what is apparently one stone in the kidney and at operation may remove a stone which resembles the X ray shadow in size and shape and still leave other stones in the pelvis because the pelvis was not thoroughly explored

3 The manipulation required to remove a stone even though gently performed produces hæmorrhage which may cover the remaining stone with a layer of fibrin so that it cannot be detected with a metal instrument.

4. Frequently unsuspected stones may slip into a dilated ureter during the operation on the pelvis

Pre-operative study and localization of the stone shadows are absolutely necessary The location and number of stones within the kidney must be determined An X ray examination should be made as close as possible to the time of operation preferably the same day Pyelograms should be made

The utmost care should be taken to prevent bleeding

Needling at the suspected location of a stone is very helpful.

Caulk's method of tapping the kidney gently to shake a stone out of the calyx into the pelvic cavity is of some value

Great care should always be taken in removing a stone in order not to break it If a small piece is broken off or allowed to remain the pelvis should be thoroughly irrigated with hot salt solution

The use of the fluoroscope in conjunction with operation may reveal small bits of stone remaining in the kidney

Barney's experience with renal stone and his studies of the records of the hospital and the literature have convinced him that there are instances in which it is impossible to remove all stones from the kidney He believes however that the number of failures will be reduced in direct proportion to the care that is taken before and during the operation

The article is concluded with the statement that

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kidney GILBERT J THOMAS, M.D.

Lockwood C D. Nephrectomy in Hunchbacks; With Report of Two Cases. *California State J M* 1922 xx, 29.

In performing nephrectomy in the case of a hunchback, Lockwood overcomes the difficulties by using a combined outer rectus incision and a transverse incision following the lower border of the ribs as far as possible. The overhanging ribs are then lifted upward by broad powerful retractors.

Up to 1908 910 cases had been reported Seven hundred and twenty two of these were of the masculine type.

MacKenzie discusses at some length the embryological development of the sex organs of both sexes and the abnormal embryological development necessary to bring about the various types of hermaphroditism HARRY CULVER, M D

Hinman, F Suprapubic Versus Perineal Prostatectomy: A Comparative Study of Ninety Perineal and Thirty Eight Suprapubic Cases. *J Urol* 1922 vi, 417

The author states that since the suprapubic prostatectomy enjoys greater general favor than the perineal prostatectomy the few men still employing the perineal route must justify their course by a detailed presentation of their results In order to evaluate the results of the two operations correctly he compares thirty-eight cases of suprapubic prostatectomy with ninety cases of perineal prostatectomy which were operated upon by the same surgeon under the same general conditions of pre-operative and postoperative care The results are carefully analyzed and the details presented in a comprehensive series of tables On the basis of this study Hinman makes the following statement

It seems logical to conclude that in our hands Young's method of perineal prostatectomy is superior to the Fuller Freyer method of suprapubic prostatectomy The general results are much better than those obtained suprapubically "

H A. FOWLER, M D

MISCELLANEOUS

Roth, L. J : Urinary Pus-Cell Count *Cal fornia State J M* 1922, xx 5

Roth has adopted the following method as a more or less accurate diagnostic and prognostic aid

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filled with the fluid as in the method used to count blood cells The eye-piece of the microscope is adjusted so that the diameter of the field is eight small squares One hundred fields are then chamber being er multiplied pus cells in 1 c mm.

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This is voided after massage and the count made with this 100 c cm. as a standard quantity

LOUIS GROSS, M D

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Syme, W S : Malignant Disease of the Throat
Canadian M Ass. J., 1921 xi 887

Syme believes that malignant disease of the throat is a field for the laryngologist and not for the general surgeon because the former is better acquainted with the improved methods of examination including the direct methods, and hence is better acquainted with the anatomy of the parts.

In any suspicious case viz. cases of hoarseness persisting for two weeks difficulty in swallowing particularly if associated with loss of weight, pain on swallowing and cough, a thorough examination with the aid of all known methods is demanded. Examination by the reflected light of the laryngeal mirror and direct examination with the suspension laryngoscope and the tubes are indicated.

For examining the nasopharynx Syme prefers Yankauer's speculum. In dealing with growths in the pharynx and larynx he prefers the suspension method, but others employ the tubes. When either is used a portion of the growth should be removed and its extent and mobility determined.

Examination by means of the X rays sometimes gives important information, and examination of glandular involvement is essential before the question of operation and its extent can be determined Not only the cervical glands but those in the mediastinum must be considered. The latter will cause pressure on the bronchi or veins and the recurrent nerves.

Thyrotomy is useful in intrinsic disease of the larynx, and laryngectomy when the disease has progressed beyond the confines of the larynx and the very upper part of the trachea but has not extended into the food passages. In laryngectomy it must be possible to divide the trachea well below the larynx and yet leave sufficient tissue to bring forward to attach to the skin.

The alternatives to total removal are the methods in which Trotter of London has been a pioneer These procedures aim to remove the growth without breaking the continuity of the food and air passages. What Semon did in the way of limiting operative procedures for intrinsic carcinoma of the larynx, surgeons like Trotter are doing in regard to malignant disease of the pharynx and the extrinsic portions of the larynx. The operative methods are adapted to growths in different parts of the pharynx. Tracheotomy is performed several days previously or at the time of the major operation. The pharynx is then packed There are two distinct stages in the operation, the exposure of the growth and its removal. In some cases a third stage is necessary when a plastic procedure is required to restore the wall of the food passage and to safeguard the opening into the larynx when a part of the œsophagus has been sacrificed

The incision extends along the anterior border of the sternomastoid muscle practically from the tip of the mastoid to the clavicle If the growth is in the lower part of the pharynx it need not begin so high up and if it is in the upper part it need not go so far down. The dissection is carried down to the constrictor muscles of the pharynx and to the wing of the thyroid the muscles attached to the latter being divided. The sheath of the large vessels is then determined and to minimize the risk of septic infection passing along it and the danger of subsequent serious and even fatal hæmorrhage from ulceration of the vessel walls the vessels are shut off from the operation cavity by stitching the anterior border of the sternomastoid to the aponeu.o

the constrictor muscles to expose the mucous membrane. If the growth involves the pharyngeal wall it may be possible to outline it before opening the pharynx. A careful examination is made to determine the extent of the growth and whether it is still confined to the mucous membrane or has passed beyond the cavity of the pharynx and invaded the adjacent structures. However detailed and careful the preliminary examination, it is in many cases impossible to determine before operation the whole extent of the involvement.

The pharynx is opened by a vertical incision passing if possible through the uninvaded mucosa. Again a careful examination is made. The larynx can be easily rotated to examine its posterior surface. Even at this stage the advisability of proceeding with the operation must be considered again Further surgical steps are adapted to the conditions found the rule being to cut wide of the disease (and this applies to the larynx as well as the pharynx) taking special care not to make an accidental perforation of the posterior wall of the larynx or trachea when the position of the disease might make this possible. If there is glandular

food passage and has the removal of the portion of larynx been so limited that it is possible to safeguard its opening? If it has been necessary to remove the lower pharyngeal wall in its whole circumference, the œsophagus must be anchored to the skin though it may be possible later to restore

the continuity of the food passage If a sufficient and continuous portion of the wall remains, the anterior flap of skin is turned in and attached to the

to complete the restoration of the pharynx This part of the operation is by no means easy and the resulting fistula is overcome only with difficulty

It is in regard to the larynx, however that the chief difficulty arises Trotter endeavors to overcome it by stitching up the larynx under the root of the tongue so that when the tongue arches in swallowing the upper opening is covered The great value of maintaining the windpipe for speech, however

the continuity of the pharynx when an extensive removal of its wall has been part of the operation

If the region of the tonsil pillars or root of the tongue is the part involved another incision is made joining the incision along the sternomastoid from the tip of the mastoid to the chin The triangular flap thus made is turned downward and forward, the jaw is divided in front of the masseter muscles, and the two halves are forcibly retracted In this way a particularly good exposure of the tonsillar region is obtained

For growths involving the epiglottis a transhyoid incision is sometimes recommended

Otto M Rott M D

MOUTH

Pimenta, A.: Vulcanite Restoration of a Receding Upper Jaw *Dental Cosmos* 19 lxiv 71

The case reported was that of a man about 40 years of age whose upper jaw receded to such an extent that the lower incisors extended about ⅜ in in front of the upper incisors All of the molars, both upper and lower had been extracted When the mouth was closed the upper incisors came in contact with the floor of the mouth just posterior to the base of the alveolar process This condition rendered mastication of solid food impossible The patient was wearing a partial denture of gold in the upper jaw and a bar denture with rubber attachment in the lower jaw There was no articulation

The author made a denture for the upper jaw The artificial teeth were arranged to articulate with the protruding lower ones, and the upper natural teeth were allowed to pass through an opening in

The result was very satisfactory and the patient was able to masticate solid food

Margaret I Maloney

Hartzell, T B.: When to Extract and When to Conserve Diseased Teeth. *Dental Cosmos* 1922, lxiv 43

When the X ray shows no bony disease when evidence of pathologic change cannot be elicited by palpation of the soft tissues over the root ends or by percussion of the teeth themselves with steel instru-

source of an injurious bacterial invasion. In order

a secondary anemia the conclusion may be drawn that bacterial invasion is going on and that the danger is sufficient to justify extraction On the other hand the blood examination may reveal a diminished number of leucocytes In a case presenting a leucocyte count of 6,500 or less, an increased proportion of lymphocytes over phagocytes, and a secondary anemia, a positive warning is given that the patient is in serious danger and the extraction should be performed as soon as he can tolerate

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unable to combat the large numbers of bacteria thrown into the blood stream by the extraction because of the decrease in the number of leucocytes.

The examination of the urine should not be neglected The presence of casts, albumin sugar or

such teeth present radiographic evidence of deep

leucocyte count is decreased.

Margaret L Maloney

McGauley W G and McGauley F H.: Epilepsy Due to Unerupted and Impacted Molars. *Dental Cosmos* 1922 lxiv 30

The authors report the case of a boy, 15 years old who had been subject to epileptic fits for two years. Repeated examinations failed to reveal the cause. On April 12 the patient experienced a dull feeling on the left side of the face, which was followed by a

where he was advised to have the second molar tooth extracted, although it was in perfect condition He then consulted a dentist who advised him not to have the tooth extracted Another dentist

advised a radiographic examination. The radiograph disclosed a partially developed and unerupted third molar in the left lower jaw The Wassermann examination was negative

The patient was anæsthetized with ether iodine was applied posterior to the second molar over the operative field an incision was made, and the tooth removed. The cavity was then thoroughly swabbed with tincture of iodine and a small piece of iodoform gauze was placed in the opening and allowed to remain there for twenty four hours Healing occurred normally There was no recurrence of the twitching of the facial muscles until April 21 when the patient returned for examination stating that he had experienced the same peculiar pain in the right side of the face but no recurrence of the epilepsy

Radiographic examination of the right side revealed a condition similar to that which was found on the left side Therefore on April 23 the right side was operated upon in the same way Healing again occurred normally

On July 15 when the patient reported for examination, he was improved in appearance and condition and had had no epileptiform attacks or convulsions since the removal of the third molars.

MARGARET I MALONEY

Arnone, L.: On the Therapeutic Action of the X Rays in Diseases of the Oral Cavity *Dental Cosmos* 1922 lxiv 73

Arnone's first patient was an army officer who returned from war with a serious form of trench mouth. Hygienic treatment attention to general hygiene the most scrupulous cleanliness, and the electric cautery afforded only temporary relief The X ray was finally used as advised by Posch

The first application was of ten minutes duration with an interval of five minutes to rest the mouth The gums immediately became paler and the patient noticed a sensation of dryness and heat. Other applications were given at three-day intervals. At the fourth sitting the improvement was such that all bleeding and discomfort had ceased completely and there was no offensive odor from the mouth After the sixth application twenty days after the first sitting all raw surfaces had healed and the gums had resumed their normal aspect After a month and a half when the X ray applications had been suspended regeneration of the gum tissue which ha

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After experimenting for six months the author is convinced that diseases of the mouth open up a new therapeutic field for the X rays and that excellent results may be expected He believes that if the necessary precautions are taken and the

yet no definite conclusions can be drawn However when the disease has just begun and the patient is young one may be sure of 100 per cent cures. Following the extraction or loss of teeth in the cases of old persons with pyorrhœa the alveolus often remains open and the gums are tender and do not adhere to the bone In such cases the X rays stimulate the periosteum and cause rapid cicatrization of the wound In hæmorrhagic gingivitis they have an excellent hæmostatic effect

MARGARET I MALONEY

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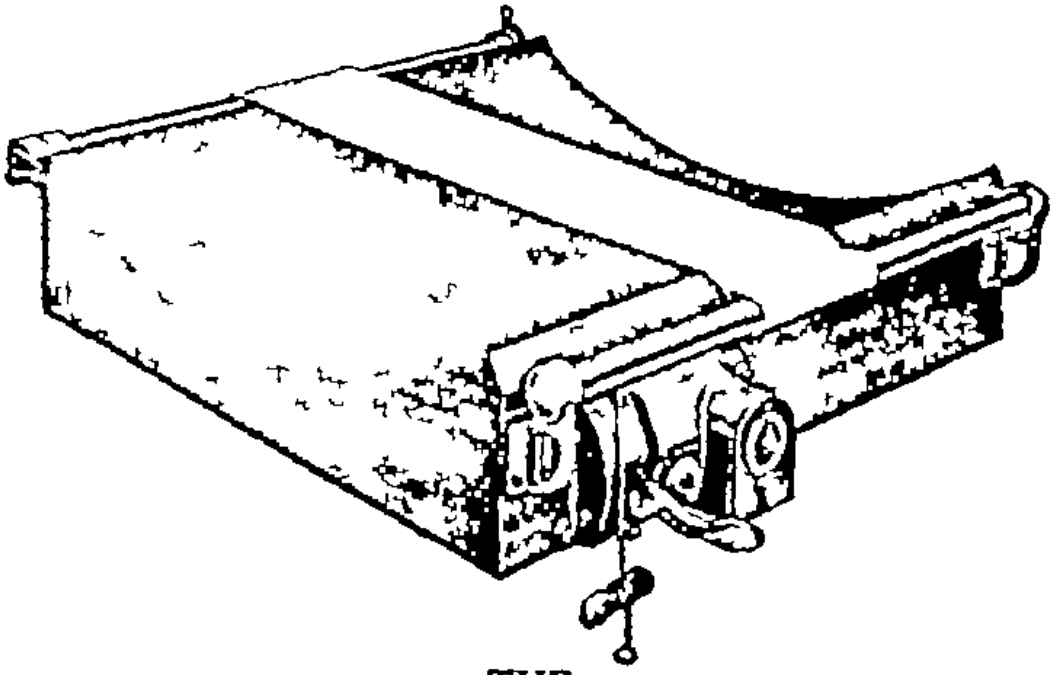
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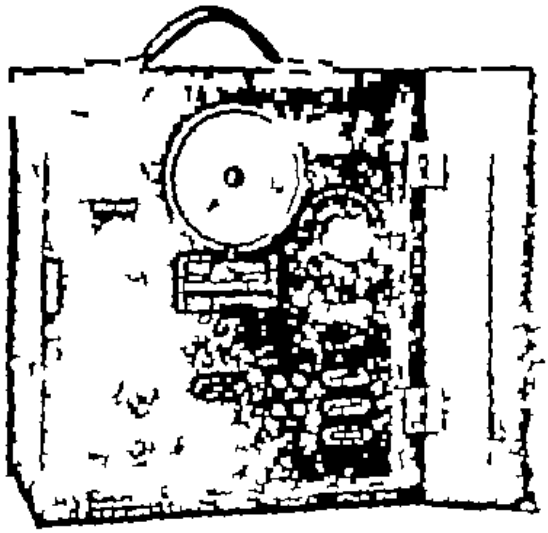
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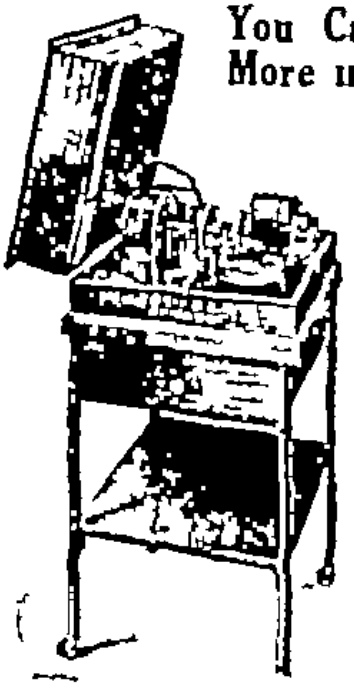
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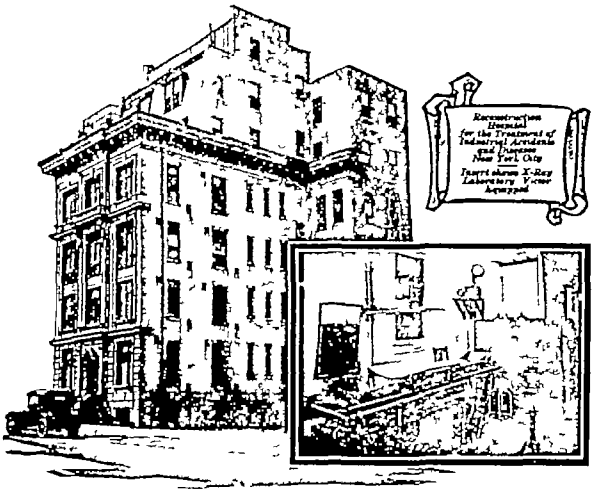
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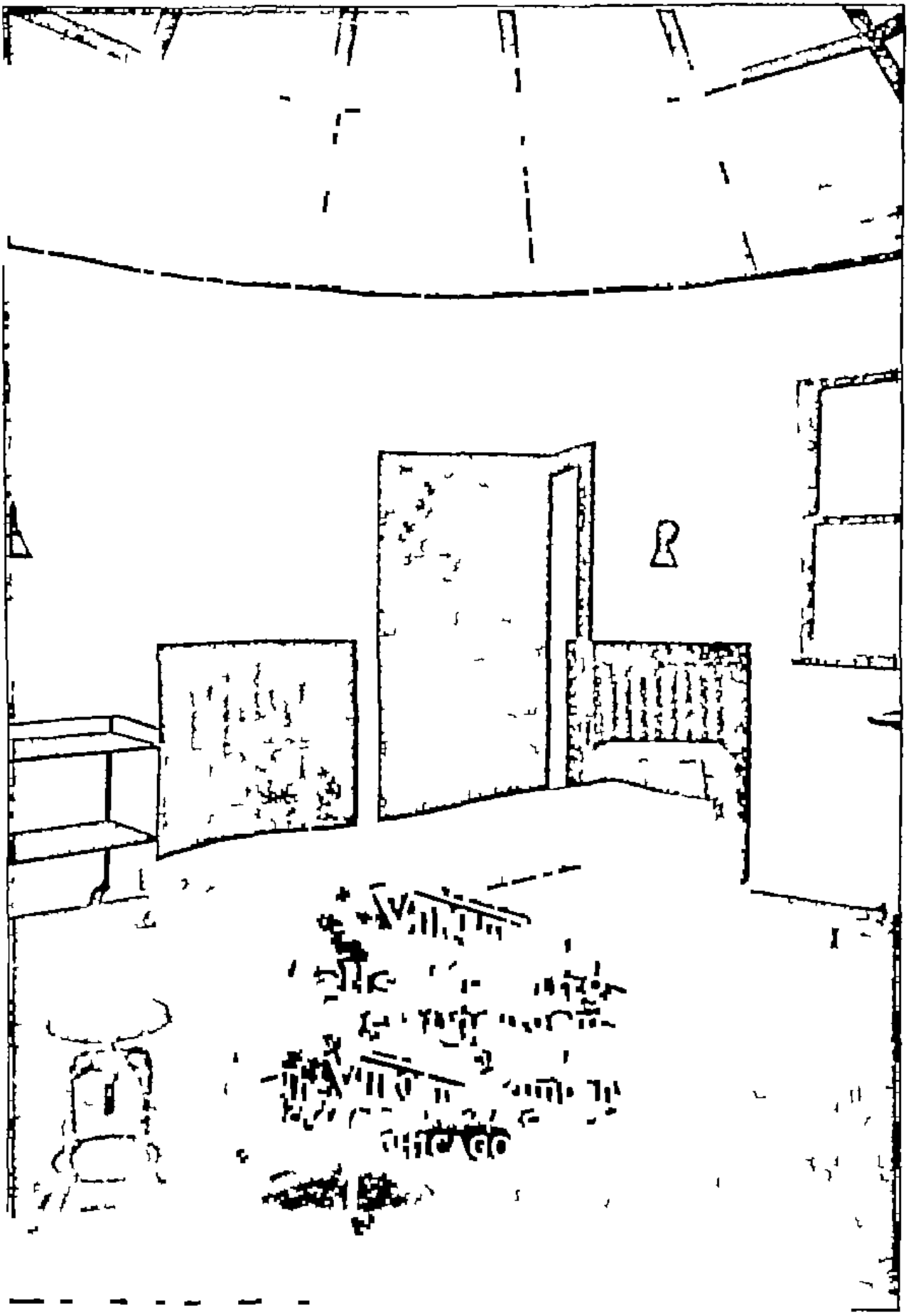
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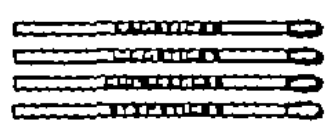
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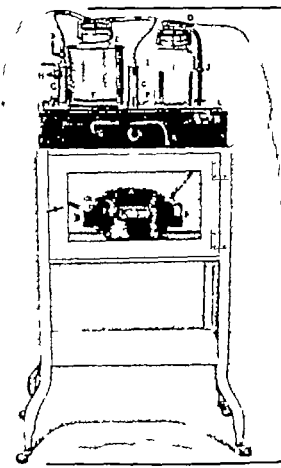
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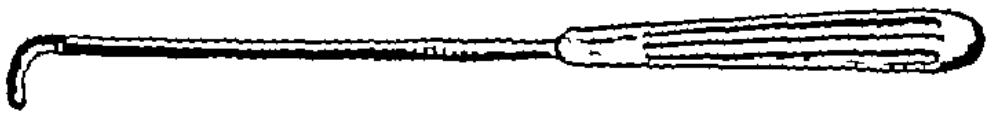
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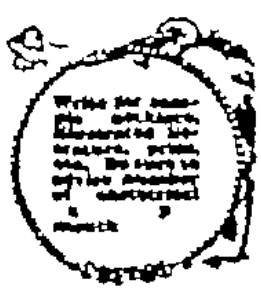
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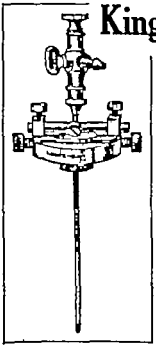
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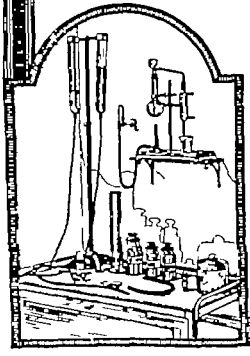
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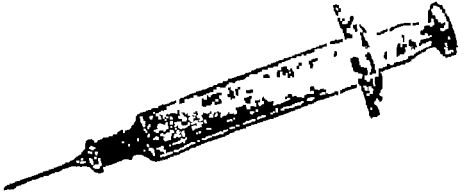
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